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# **HOUSEHOLD HAZARDOUS WASTE COLLECTION AND FACILITY GUIDELINES**

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**Ministry of  
Environment  
and Energy**



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COLLECTION AND FACILITY GUIDELINES**

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**HOUSEHOLD HAZARDOUS WASTE  
COLLECTION AND FACILITY GUIDELINES**

Report prepared for:

Waste Management Branch  
Ontario Ministry of Environment and Energy

Report prepared by:

MacLaren Engineers Inc.



### Abstract

These Guidelines are intended to assist municipalities and others in the design and implementation of household hazardous waste collection programs and facilities. The following are included in the document:

- review of household hazardous waste collection in Ontario and elsewhere;
- general household hazardous waste collection facility siting and design considerations;
- household hazardous waste collection facility operating procedures;
- required documentation for operating household hazardous waste collection facilities;
- household hazardous waste management procedures, with particular emphasis on waste diversion;
- public education and publicity initiatives related to household hazardous waste management;
- options for household hazardous waste collection program design.

While these Guidelines will assist in achieving preferred household hazardous waste management in Ontario, each user of the document should evaluate their own needs and requirements and act accordingly.





### Disclaimer

These Guidelines, which have been prepared by MacLaren Engineers Inc. for the Ontario Ministry of the Environment, have been reviewed and approved by the Ministry for general use to assist in household hazardous waste collection and facility design in Ontario. However, all users of this document should determine their own specific requirements and should design and implement household hazardous waste collection programs and facilities accordingly. Neither the Ontario Ministry of the Environment nor MacLaren Engineers Inc. are responsible in any circumstance for any aspect of the design, performance or operation of any household hazardous waste collection program or facility.



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## 1.0 OBJECTIVE AND SCOPE

This document is intended to assist municipalities and private operators determine the needs associated with the design and operation of a facility for the collection and management of household hazardous waste. The information provided must permit household hazardous waste program operators to decide which collection system best suits the municipality's needs.

In some cases, the program that best serves the community will be based on a regular collection system operated from a permanent facility. Recognizing the additional planning and effort required to implement a permanent facility, guidelines for construction and management are provided. In addition, the focus throughout the document is two-fold: 1) to identify areas which can benefit from 3R activities (reduce/reuse/recycle); and 2) to provide cost estimates of different collection systems. Although this manual focuses on the various stages involved in the design and operation of a permanent facility, the operating guidelines are applicable to any other household hazardous waste collection program.

The range of small quantities of hazardous wastes considered in this document focuses on household hazardous waste, most of which can be classified into the following categories: paints, solvents, adhesives, pesticides, acids/bases, aerosols, fuels and batteries.

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Attention is given to the legislative and design criteria required in constructing a permanent facility, complemented by construction and operating cost estimates. Operational safety guidelines have also been addressed to ensure proper handling and management of the hazardous waste materials. Procedures for managing a variety of specialized wastes have received discussion with emphasis placed on 3R opportunities. A description of public educational and promotional activities completes the requirements for a comprehensive household hazardous waste collection facility. Appendix A provides a basis of comparison with other collection systems operating throughout Ontario and North America and Appendix B identifies possible markets for recyclable household hazardous wastes. Local Ministry of the Environment offices are identified in Appendix C.

Throughout this document, it is intended that the guidelines provided should be used as general requirements for the development of specific facilities. It will not necessarily be appropriate for all facilities to adopt all the design, operating and other criteria contained in this document.

### 1.1 An Overview of Ontario's Programs

Since the Ministry of the Environment (MOE) first began to fund household hazardous waste programs in 1986 there has been a surge in the number of municipalities offering collection services. In 1986 a total of 9 collection events were implemented in Ontario, increasing to 18 in 1987, 33 in 1988, 42 in 1989 and 43 in 1990. A comparison of Tables 1-1, 1-2, 1-3, 1-4 and 1-5 reveals some interesting points about the evolution of these programs.

- Over the past several years, the increase in media and public attention related to the management of household hazardous waste has corresponded with an increase in the average number of households participating in the collection events.
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- Many municipalities which have offered the collection programs on a regular basis continue to experience a constant number of participants (e.g. Hamilton and Niagara Falls) and in many cases, have experienced an increase in the number of participants over the years (e.g. London, Waterloo and Orillia).
- The average amount of household hazardous waste collected from these programs also continues to increase.
- Paint products generally represent the largest quantity of waste received at the collection events in the years between 1986 and 1989.
- In general, the per kilogram cost to dispose of household hazardous waste has steadily declined over the years. This decline in operating and disposal cost may be attributed to new methods of bulking waste materials, such as paints.
- Household hazardous waste programs have begun to evolve beyond the traditional collection day events. Municipalities are experimenting with door-to-door services and permanent depot collection systems. These new collection methods target sectors of the population who cannot partake in regular collection day events.

Significant quantities of household hazardous waste were reutilized in 1989, as indicated in Table 1-6. In part, reutilization has included a wide variety of management approaches including recycling through reformulating paint, recovery of solvents from the paint and use of the paint as a fuel supplement in jurisdictions where this is permitted. Reutilization of oil has been undertaken through re-refining. Lead acid batteries have been recycled through secondary lead facilities. A prominent propane supply company has managed reutilization of propane cylinders.

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TABLE 1-1  
HOUSEHOLD HAZARDOUS WASTE COLLECTION  
PROGRAMS IN ONTARIO FOR 1986

PROGRAM	LOCATION	# OF HOUSE HOLDS	COST (\$)	PAINTS (kg)	IN- ORGANICS (kg)	SOLVENTS (kg)	FUELS (kg)	PESTICIDES (kg)	OIL (kg)	MISC. ORGANICS (kg)	COMP. GAS (1) (kg)	TOTAL (kg)
SARNIA	SARNIA	100	19526	1446	748	143	0	53	4	269	91	2764
WATERLOO	WATERLOO	154	13984	287	107	191	0	4	5	20	0	614
CAMBRIDGE	CAMBRIDGE	42	10972									
DUNDAS	DUNDAS	112	20070									
HAMILTON	HAMILTON	135	21858	2347	212	52	0	265	1000	1	49	3926
KENORA	KENORA	158	24767	2574	222	0	0	142	2786	200	0	5924
BURLINGTON	BURLINGTON	500	55147	12417	1516	1762	0	676	1037	125	194	17726
MILTON	MILTON	70	16667	780	151	0	0	210	344	0	21	1506
NORTH YORK	NORTH YORK	67	14658	1333	248	192	0	71	544	0	23	2411
TOTAL		1338	197649	21184	3204	2340	0	1422	5720	614	378	34871
AVERAGE		148.67	21961	3026	458	334	0	203	817	88	54	4982
PERCENTAGE				61%	9%	7%	0%	4%	16%	2%	1%	

Note: (1) Empty compressed gas cylinders

**TABLE 1-2**  
**HOUSEHOLD HAZARDOUS WASTE COLLECTION**  
**PROGRAMS IN ONTARIO FOR 1987**

PROGRAM	LOCATION	# OF HOUSE HOLDS	COST (\$)	PAINTS (kg)	IN- ORGANICS (kg)	SOLVENTS (kg)	FUELS (kg)	PESTICIDES (kg)	OIL (kg)	MISC. ORGANICS (kg)	COMP. GAS (l) (kg)	TOTAL (kg)
LONDON	LONDON	100	24989	978	97	104	152	360	262	360	39	2352
SARNIA	SARNIA		37890	2940	880	0	0	540	0	10	0	4370
NIAGARA FALLS	NIAGARA FALLS	300	23417									
GRIMSBY	GRIMSBY	150	23700									
WATERLOO	CAMBRIDGE	54	4539	594	104	68	0	8	345	25	0	1144
	WATERLOO	273	11849	3415	1581	218	0	99	622	121	100	6156
	DUNDAS	139	26057	7893	1435	0	0	615	820	205	205	11173
HAMILTON	HAMILTON	189	31525	6560	2255	2665	0	1435	1025	820	410	15170
	KENORA	200	33786	6355	2255	6355	0	820	0	615	410	16810
PEEL	MISSISSAUGA		40899	1260	50	0	0	30	0	0	0	1340
TINY TWP	TINY TWP		11292									
HALTON HILLS	HALTON HILLS		34600									
NORTH SIMCOE	NORTH SIMCOE		23562									
ORILLIA	ORILLIA		11341	475	150	0	280	85	0	50	0	1040
NORTH YORK	NORTH YORK		20219	720	560	0	0	0	0	760	0	2040
SCARBOROUGH	SCARBOROUGH	448	66620	4544	1055	0	0	640	0	4722	100	11061
TORONTO	TORONTO	445	76700	5000	1680	0	0	720	0	5160	100	12660
	TORONTO	660	94947	6160	1449	0	0	556	205	6284	540	15194
<b>TOTAL</b>		2958	597931	46094	13551	9410	432	5908	3279	19132	1904	100510
<b>AVERAGE</b>		219	26753	2896	939	846	28	427	281	733	123	7030
<b>PERCENTAGE</b>				47%	13%	9%	0%	6%	3%	19%	2%	

Note: (1) Empty compressed gas cylinders

TABLE 1-3  
HOUSEHOLD HAZARDOUS WASTE COLLECTION  
PROGRAMS IN ONTARIO FOR 1988

PROGRAM	LOCATION	# HOUSE HOLDS	COST (\$)	PAINTS (kg)	IN- ORGANIC (kg)	SOLVENT (kg)	FUELS (kg)	PESTICIDE (kg)	OIL (kg)	MISC ORGANIC (kg)	GAS (kg)	TOTAL (kg)
LONDON	LONDON		10995	3039	1020	96	575	84	1146	1	5	5967
ESSEX-WINDSOR	GOSFIELD	97	26381	1394	1799	0	0	1977	3675	0	0	8835
	WINDSOR	408	32983	15068	3074	0	0	1159	5500	205	0	25005
	AMHERSTBURG	101	23445	3182	1814	0	205	2477	1546	205	0	9427
CLEARWATER TWP	CLEARWATER TWP		55684									
ST CATHARINES	ST CATHARINES	576	72711	11198	489	0	0	426	1244	2457	14	15828
NIAGARA FALLS	NIAGARA FALLS	500	53000									
GUELPH	GUELPH	372	26949									
PELHAM	PELHAM, TOWN	256	30925	2500	1102	0	205	400	0	2650	10	6867
WEST LINCOLN	WEST LINCOLN	89	20956	1360	300	0	0	350	3	1560	10	3580
HAMILTON	DUNDAS	300	23724									
	KENORA	353	25793									
	MOUNTAIN	393	27381									
WATERLOO	CAMBRIDGE	113	9014	1638	441	140	0	10	327	117	120	2793
	WATERLOO	396	19836	3826	1534	301	0	97	1012	298	69	7137
BARRIE	BARRIE	343	41176	3800	720	0	0	410	0	3840	25	8795
TORONTO	KEELE	116	27704	5039	414	201	34	54	208	0	27	5975
	INGRAM	212	28511	5654	466	488	74	149	95	51	16	6993
	BROCK	298	59564	12304	3652	312	284	255	2020	185	1522	20533
	SCARBOROUGH	333	32470	7141	812	740	57	172	204	63	10	9199
ORILLIA	ORILLIA	115	13774	798	267	26	7	89	526	18	40	1771
PEEL	MISSISSAUGA	2481	174261									
HALTON	MILTON		116353									
NEWMARKET	NEWMARKET	522	34835	6220	2270	3578	102	462	0	0	2386	15018
AURORA	AURORA	202	22939	2407	879	1385	39	179	0	0	923	5811
BRADFORD	BRADFORD	67	9521	798	291	159	13	59	0	0	306	1928
GWILLIMBURY	GWILLIMBURY	134	15428	1597	583	919	26	119	0	0	612	3855
CORNWALL	CORNWALL		71954	6680	822	0	20	280	0	6685	290	14777
BROCKVILLE	BROCKVILLE	135	22017									
SUDBURY	SUDBURY	207	33190	4041	848	148	71	167	1006	214	181	6673
ONAPING FALLS	ONAPING FALLS	7	9249	58	78	6	0	6	53	19	9	230
NICKEL CENTRE	NICKEL CENTRE	20	10776	403	122	21	20	43	108	6	14	737
VALLEY EAST	VALLEY EAST	9	9444	184	0	7	0	5	47	22	5	269
TOTAL		4923	616734	100331	23786	8526	1730	9429	18719	18593	6595	188003
AVERAGE		290	32460	5000	1201	118	106	604	1290	890	140	9826
PERCENTAGE				53%	13%	5%	1%	5%	10%	10%	4%	

**TABLE 1-4**  
**HOUSEHOLD HAZARDOUS WASTE COLLECTION**  
**PROGRAMS IN ONTARIO FOR 1989**

PROGRAM	LOCATION	# OF HOUSE HOLDS	COST (\$)	PAINTS (kg)	IN- ORGANICS (kg)	SOLVENTS (kg)	FUELS (kg)	PESTICIDES (kg)	OIL (kg)	MISC. ORGANIC (kg)	COMP. GAS (l) (kg)	TOTAL (kg)
LONDON	LONDON		16915	5330	0	615	0	0	3632	0	0	9577
ESSEX-WINDSOR	GOSFIELD	178	60970	9943	1275	114	114	8258	4949	0	0	24651
	WINDSOR	690	73990	42676	1634	205	205	6651	8513	0	0	59894
	BELLE RIVER	221	14998	7082	545	136	136	2906	1975	0	0	12780
CHATHAM	CHATHAM	238	28049	1600	1025	0	0	2255	2500	3280	0	10660
KENT COUNTY	KENT COUNTY	241	40774	1600	2255	205	205	8405	6100	2688	0	21253
CLEARWATER TWP	CLEARWATER TWP		64677	1976	2220	100	0	800	1910	7974	96	15076
GRIMSBY	GRIMSBY	214	36122	9020	615	410	0	615	1640	8605	0	20905
WEST LINCOLN	WEST LINCOLN	130	25865	4920	615	410	410	2050	1025	8605	0	18035
N-ON-THE-LAKE	N-ON-THE-LAKE	211	31980	800	650	0	0	1300	1000	6100	22	9872
HAMILTON	DUNDAS	393	34570	9020	7715	1845	0	0	7494	19847	3160	49081
	KENORA		30397	AMOUNT INCLUDED IN DUNDAS PROGRAM								
	MOUNTAIN	366	35046	AMOUNT INCLUDED IN DUNDAS PROGRAM								
WATERLOO	CAMBRIDGE	154	12401	0	15	0	0	0	1589	3405	300	5309
	WATERLOO	440	30961	4255	40	605	0	160	2838	1500	80	9478
ORANGEVILLE	ORANGEVILLE	225	24910	0	887	0	800	150	2100	5600	10	9547
NIAGARA FALLS	NIAGARA FALLS	500	57974	2000	762	13340	0	850	1000	260	60	18272
HALD-NORFOLK	HALD-NORFOLK	300	47309	700	680	0	0	300	2860	6180	20	10740
PETERBOROUGH	PETERBOROUGH	600	59401	38400	360	0	0	250	1362	420	30	40822
ESSA TWP	ESSA TWP	51	14523	0	104	0	0	90	680	920	50	1844
SOUTH SIMCOE	SOUTH SIMCOE	544	53899	4400	690	0	0	680	900	7090	37	13797
BARRIE	BARRIE	363	93745	0	10045	820	0	4500	39975	1845	57185	
LINDSAY	LINDSAY	163	32582	2800	1040	0	0	1362	1440	0	0	6642
BRACEBRIDGE	BRACEBRIDGE	100	25303	1025	615	0	0	205	1068	5125	0	8038
ORILLIA	ORILLIA	350	33242	0	833	0	0	1362	16210	0	0	18405
ELMVALE	ELMVALE		8303	0	45	0	0	40	0	1000	32	1117
TINY TWP	TINY TWP		5233	0	0	0	0	0	200	373	0	573
TORONTO	10 DEPOTS	6182	999179	47560	22158	3715	0	4782	5963	130817	528	215523
	TOXICS TAXIS	1615	201044									
PEEL REGION	BRITANNIA LANDFILL		223843	31920	2718	0	1640	1777	59132	10640	899	108726
	MISSISSAUGA-TRICIL	1082	116190	0	4715	0	0	0	4100	70315	0	79130
NORTH SIMCOE	NORTH SIMCOE	83	22610	675	200	0	0	0	842	131	100	1948
HALTON	BURLINGTON	2335	236274	17115	8784	1917	0	3692	9281	3380	0	44169

TABLE 1-4 CONT'D  
HOUSEHOLD HAZARDOUS WASTE COLLECTION  
PROGRAMS IN ONTARIO FOR 1989

PROGRAM	LOCATION	# OF HOUSE HOLDS	COST (\$)	PAINTS (kg)	IN- ORGANICS (kg)	SOLVENTS (kg)	FUELS (kg)	PESTICIDES (kg)	OIL (kg)	MISC. ORGANIC (kg)	COMP. GAS (l) (kg)	TOTAL (kg)
	MILTON	413	121116	0	4100	1145	225	1230	820	3690	0	11210
CORNWALL	CORNWALL		47579	0	80	0	0	613	409	22882	204	24188
BROCKVILLE	BROCKVILLE		43217	5360	800	0	0	240	0	960	480	7840
KINGSTON	KINGSTON	604	62006	1845	4964	410	0	0	1550	13900	40	22709
NAPANEE	NAPANEE		13084	200	2180	0	0	0	681	0	20	3081
PITTSBURGH TWP	PITTSBURGH TWP	257	34189	2000	3810	0	0	480	1023	1605	16	8934
SUDBURY	SUDBURY	108	25295	1650	677	0	502	98	225	933	11	4096
ONAPING FALLS	ONAPING FALLS	33	17185	454	128	0	60	19	390	178	1	1229
<b>TOTAL</b>		19384	3146951	256326	89979	25787	4297	48895	146974	406027	8041	986326
<b>AVERAGE</b>		606	76755	6408	2368	687	113	1287	3868	10685	212	24658
<b>PERCENTAGE</b>				26%	9%	3%	0%	5%	15%	41%	1%	

Note: (1) Empty compressed gas cylinders

TABLE 1-5

PROGRAM	LOCATION	# OF HOUSE HOLDS	COST (\$)	PAINTS (kg)	IN-ORGANICS (kg)	SOLVENTS (kg)	FUELS (kg)	PESTICIDES (kg)	OIL (kg)	MISC. ORGANIC (kg)	COMP. GAS (l) (kg)	TOTAL (kg)
CHATHAM / KENT	CHATHAM	710	109151	0	1002	0	0	0	6129	22000	0	29131
BENTINCK	BENTINCK		30167	800	310	0	0	240	0	3904	0	5254
LEAMINGTON	GOSFIELD SOUTH		34095	0	7380	0	0	5195	1845	9635	320	24375
AMHERSTBURG	AMHERSTBURG		28700	0	4920	0	0	0	1230	10660	2460	19270
WINDSOR	WINDSOR		83630	0	6308	0	0	1435	1230	39565	2215	50753
BELLE RIVER	BELLE RIVER		38990	0	500	0	0	1000	1800	9450	900	13650
ST. CATHARINES	ST. CATHARINES		192670	8670	4920	0	0	1200	10670	45250	670	71380
WATERLOO REG.	WATERLOO	966	56327	0	695	205	0	700	3485	12130	80	17295
	CAMBRIDGE	363	24042	0	3230	400	0	150	2255	3020	84	9139
PORT COLBORNE	PORT COLBORNE		34522	0	636	0	0	240	2500	4165	274	7815
FORT ERIE	FORT ERIE	600	68824	800	1800	0	0	0	5400	18400	360	26760
PELHAM	PELHAM	108	43264	0	4860	2050	205	2870	3075	20500	98	33658
GRIMSBY	GRIMSBY	488	58912	2050	5050	0	0	820	5125	26855	2460	42360
THOROLD	THOROLD	100	4889	1230	6170	0	0	1025	2870	10250	320	21865
HALD-NORFOLK	HALD-NORFOLK	446	63866	1410	1095	0	0	2620	5145	6530	85	16885
ORANGEVILLE	ORANGEVILLE	284	35545	1000	180	0	0	0	400	7230	350	9160
BRANTFORD	BRANTFORD	750	95150	0	1160	100	0	0	3941	24300	0	29501
NIAGARA FALLS	NIAGARA FALLS	600	54520	1800	2215	0	0	400	4000	11000	1800	21215
LINDSAY	LINDSAY	161	21157	505	320	0	0	0	908	3500	40	5273
HALTON REGION	BURLINGTON/MILTON	5357	478549	55745	3133	5093	0	2920	17315	4525	0	88731
ESSA	ESSA	75	15145	0	120	0	0	0	1477	2480	10	4087
PETERBOROUGH	PETERBOROUGH	656	55157	3800	1010	0	0	0	2270	8460	30	15570
WHITCHURCH-STOUFFVILLE	WHITCHURCH-STOUFFVILLE											
SOUTH SIMCOE	STOUFFVILLE	288	45853	7038	336	0	0	558	1844	3080	4	12860
	ALLISTON, BRADFORD											
	TECUMSETH TWP	557	55706	2465	1010	0	80	1180	1989	7790	36	14550
NEWMARKET	NEWMARKET	1800	240249	8095	3000	0	0	800	7585	27700	0	47180
RICHMOND HILL	RICHMOND HILL		229940	8600	2800	0	0	400	3600	33620	1	49021

TABLE 1-5 CONT'D  
HOUSEHOLD HAZARDOUS WASTE COLLECTION  
PROGRAMS IN ONTARIO FOR 1990

PROGRAM	LOCATION	# OF HOUSE HOLDS	COST (\$)	PAINTS (kg)	IN- ORGANICS (kg)	SOLVENTS (kg)	FUELS (kg)	PESTICIDES (kg)	OIL (kg)	MISC. ORGANIC (kg)	COMP. GAS (l) (kg)	TOTAL (kg)
CALEDON EAST	CALEDON EAST	337	42197	3280	320	0	205	0	1800	3080	4	8689
BARRIE	BARRIE		130969	0	2265	0	0	0	0	26490	58	28813
METRO TORONTO	METRO TORONTO	15841	1410955	65500	83189	0	0	10072	17640	334960	1864	513225
PITTSBURGH	PITTSBURGH	263	30858	1940	320	0	0	0	0	3360	0	5620
KINGSTON	KINGSTON	849	80052	1640	1200	0	0	0	3400	7092	0	13332
CORNWALL TWP	CORNWALL TWP		8762	0	104	0	0	100	400	1500	0	2104
OSNABRUCK	OSNABRUCK		8745	0	101	0	100	0	200	1800	0	2201
CORNWALL	CORNWALL	540	88100	0	675	410	0	550	3410	17755	0	22800
BROCKVILLE	BROCKVILLE		70704	8880	1300	0	0	320	3000	1200	220	14920
CHARLOTTENBURGH	CHARLOTTENBURGH		11276	150	70	0	0	240	300	1200	0	1960
LANCASTER	LANCASTER		8706	140	118	0	0	80	700	720	0	1758
NAPANEE	NAPANEE	170	21777	600	575	0	0	400	1200	2700	3	5478
NORTH BAY	NORTH BAY	410	37131	600	910	0	400	0	0	5320	20	7250
SUDBURY	SUDBURY	316	64263	4960	2575	0	260	160	3280	3110	60	14405
THUNDER BAY	THUNDER BAY	490	67141	1580	1053	0	0	780	3473	9640	2	16528
<b>TOTAL</b>		33505	4278656	193278	158935	8258	1250	36455	136891	795926	14828	1345621
<b>AVERAGE</b>		1241	104357	4714	3876	201	30	889	3339	19413	362	32825
<b>PERCENTAGE</b>			14%	14%	12%	1%	0%	3%	10%	59%	1%	

Note: (1) Empty compressed gas cylinders



## 1.2 **Financial Support**

Municipalities can apply for Ministry of the Environment grants to help offset the operating and capital costs associated with household hazardous waste collection programs. Prior to April 1989, the grant program focused specifically on providing financial assistance to municipalities offering collection day events. Municipalities were eligible to receive grants up to 50% of the operating costs to a maximum of \$10,000.

The revised program, introduced April 1, 1989, continues the Ministry's practice in sharing the costs of household hazardous waste collection programs. The program's expanded agenda permits municipalities to receive financial assistance for projects involving special waste days/week-ends as well as permanent depots/facilities.

Potential operating grants received by municipalities, community associations and unorganized settlements has been increased to \$15,000 with emphasis placed on recycling and reuse activities for paints, used motor oil and other recyclable wastes. Municipalities may apply for the operating grant once per year for each collection day/week-end event held in a distinctly different geographical location.

The Ministry's revised program has also responded to the growing movement by municipalities to establish permanent depots/facilities. Municipalities that choose to construct permanent depots/facilities for household hazardous waste collection are eligible for financial support under the Financial Assistance Program (FAP). The Financial Assistance program will help fund the capital expenditures for up to a five year period with the level of funding based on the size of

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the municipal population served. Activities eligible to receive funding under FAP include building structure or expansion, equipment, hydrogeological activities and land acquisition.

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TABLE 1-6

ESTIMATED  
HOUSEHOLD HAZARDOUS WASTE REUTILIZATION  
1989<sup>1</sup>

Paint <sup>2</sup>	183,216 litres
Oil	137,449 litres
Batteries <sup>3</sup>	52,579 kilograms
Propane Cylinders	10,700 kilograms

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<sup>1</sup> Data taken from Ministry of the Environment records

<sup>2</sup> Comprises latex and oil-based paint

<sup>3</sup> Comprises lead-acid batteries only



## 2.0 FACILITY DESIGN GUIDELINES

### 2.1 Overview

This section identifies the design criteria associated with a permanent household hazardous waste facility. Precise design requirements associated with a household hazardous waste facility will vary according to the specific wastes handled at the facility and the size of the population serviced by the facility. Despite the variations in the operational procedures of the facility, the legislative and design guidelines identified below must be addressed in the construction of the facility. To further assist in the design and construction of a permanent facility, a generic site plan is included in the document which will accommodate household hazardous wastes that may be expected to be generated in a municipality with a population of 300,000 people. Smaller communities not requiring such an extensive facility can modify the site designs based on the recommendations provided at the end of this section.

The Government of Ontario has introduced stringent legislation to direct the development and operations of a hazardous waste collection system. The following section summarizes the legislative requirements to meet environmental and health and safety protection compliance and should be used for guidance in the construction of a permanent facility but should not necessarily be considered all inclusive.

### 2.2 Relevant Legislation

The applicant must attend to the following provincial legislation in the design and construction of a permanent household hazardous waste (HHW) facility.

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- Environmental Protection Act - A permanent HHW facility is designated a waste disposal site (transfer station) under Part V, Section 24 of the Environmental Protection Act (EPA), which states:

*"Waste disposal site" means any land or land covered by water upon, into, in or through which, or building or structure in which, waste is deposited or processed and any machinery or equipment or operation required for the treatment or disposal of waste R.S.O. 1980, c. 141, s.24.*

Provisions are made in the EPA requiring all waste disposal site undertakings to acquire a Certificate of Approval prior to any operations or use. The Certificate of Approval is issued for a household hazardous waste facility operating as a "disposal site/transfer" facility. This classification permits specific activities to be performed on the premises, such as bulking of wastes, but makes other activities illegal, such as treatment. A Certificate of Approval for a Waste Disposal Site (Processing) may be required in addition to a Certificate of Approval for a Waste Disposal Site (Transfer). Further specifications relating to the general environmental performance of the waste management system and the liability assumed from noncompliance are stipulated throughout the Act.

- Transportation of Dangerous Goods Act - Handling and shipping procedures for the transportation of dangerous goods are set out in this Act. Hazardous materials must be classified and segregated according to their most prevalent characteristics, such as flammability, toxicity, reactivity, explosiveness and corrosiveness. Segregation requirements ensure maximum health, safety and environmental protection against unsafe or incompatible movement of hazardous materials.
-

- Occupational Health and Safety Act - This Act specifies what measures must be taken in the construction and operation of a facility to ensure safe working conditions for the employees.

All materials specified and all the work performed must also comply with the requirements of the applicable parts of the Codes and Standards listed below. The latest editions and/or revisions of these shall be applied:

- Ontario Building Code,
- Municipal By-Laws,
- Electrical Code,
- Plumbing Code, and
- Ontario Fire Code.

### 2.3 Recommended General Design Criteria

Any municipality interested in constructing a permanent household hazardous waste facility must take into consideration a wide range of design criteria. The design must reflect an understanding of the facility's operational function and meet the appropriate health and safety standards. Site plans will attend to the site location and site services, the facility's architectural structure, and the interior layout and services. While recognizing the need to address design criteria for the site and site services, specific design needs and requirements will depend to a large extent on the selected location of the facility. For this reason, the section on site design and site services highlights the pertinent design considerations without going into explicit detail. On the other hand, less flexibility is possible on the preferred facility structural design and, consequently, more detailed information is provided relating to the building's structure and finishes. To aid in

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the discussion of permanent household hazardous waste facility design criteria, a generic building/floor plan blueprint is provided in Diagram 1 (in the rear pocket of the manual).

### **2.3.1 Site and Site Services**

The site design must accommodate easy access by residents to the facility and ensure maximum efficiency of the drive through and drop-off collection system. Consideration should be given to ensuring sufficient land area to permit future expansion of the site if this is considered appropriate in the future. Since participation will experience peak periods, the site and site service design must allow for expediency in collection and minimize traffic buildup.

#### **1. Location**

The location of a permanent household hazardous waste facility is an important consideration when establishing a convenient location in order to maximize participation rates. At the same time, it may be beneficial from insurance and approvals perspectives to use an existing municipal facility site. With these goals in mind, a number of site characteristics must be factored into the decision-making process. These include:

- adequate land for site and building requirements;
  - availability of electrical, water, and sanitary sewer services;
  - suitability of soils for road and building construction;
  - ground and surface water flow and;
  - zoning and surrounding land use.
-



## 2. Roads and Parking

Road access and parking layout are important features of the facility design criteria. Depending on the location of the facility, much of the road and parking requirements may already be met. Regardless, an evaluation of the following design considerations may help to identify inadequacies in the existing road and parking infrastructure:

- adequate access for vehicles;
  - solid concrete pads, with hardener, in any area where spills might occur;
  - adequate queue lengths for expected volume of traffic;
  - clearance from interference with other traffic if the facility is located on a municipal site;
  - the parking area for generators to deliver waste to reception area should be designed to:
    - minimize carry distance and minimize spill risk,
    - could also serve waste exchange users (see Section 5.5.2),
    - ensure wastes not to be carried through traffic areas.
  - staff parking if not provided elsewhere;
  - separate road access to shipping area for removal of waste material;
  - optional exterior loading dock in pit to accommodate the loading of waste materials from the shipping area;
  - adequate length for parking of waste removal vehicles.
-

### **3. Storm Water Management**

Provisions must be made for the proper management of storm water within the vicinity of the facility. Management of storm water should take into account the requirements of the Ontario Water Resources Act. Specific precautions can be taken to ensure that only rain water is drained to storm sewers:

- site drainage should be sloped away from the facility at the point where the overhang of the canopy over the customer drive-through area ends;
- appropriate catch basins, ditches and drain piping should be installed to deliver water to the local drain system;
- roof drains will be required to catch rain water falling on the roof and drainage will also be directed away from the building.

### **4. Site Services**

The heading 'site services' encompasses a wide range of utility services that are vital to the operation of the facility. Depending on the location of the facility, some of the utility service needs can be integrated with the existing site services. Provisions must be made to provide the following services:

- water supply;
  - fire main(s) to hydrant(s);
  - sanitary sewer for domestic purposes only;
-

- hydro/electrical service (buried or overhead);
- street lighting, if required during hours of operation; and
- site perimeter fencing (e.g. 8 ft high, chain linked with a barb-wire top).

## **5. Spills Containment Areas**

An effective spill containment system must be built into any site design to ensure that any spill of incoming hazardous wastes will be properly contained and managed. The spill catch area must not drain into the storm water drainage system. A suggested design for the site's containment area includes the following features:

- the catch area will be located under the shelter of a canopy overhang located in the designated drop-off area;
  - the parking area located under the canopy will slope to a drain leading to an underground spill containment tank or sump;
  - the external spill containment tank or sump should be emptied after any spill, be regularly monitored and, when full, be collected and treated by a licensed waste hauling company.
-

## 6. Outdoor Storage Facilities

Provisions must be made to accommodate the location of a dumpster for non-hazardous waste material. In addition, specific hazardous waste materials require outdoor storage in a designated outdoor area. Codes and standards govern outdoor storage and containment for:

- Propane cages for propane tanks; and
- Oil tanks for waste oil.

Legislation includes:

- Gasoline Handling Act, O.Reg. 439;
  - Energy Act, O.Reg. A25-82;
  - Ontario Fire Code; and
  - National Fire Code.
-

### 2.3.2 **Building Design Criteria**

The building should be designed to accommodate the best layout for a specific site and it should be sized for the storage and process facilities required at a particular location. The layout should be functional, economical and meet all the relevant code requirements. In addition, the building material selection and construction should be based on durability and economy.

### 2.3.3 **Building Construction**

Municipalities wishing to construct a permanent household hazardous waste facility must adhere to stringent structural standards. Floors, walls, ceilings, windows, doors and other openings should meet the required stresses, loads and fire code requirements to ensure adequate health and safety and environmental protection. The overall structural requirements are governed by the Ontario Building Code and local municipal by-laws. The Electrical Code, the Plumbing Code and the Ontario Fire Code, as well as standards relating to the facility design should also be adhered to. The following categories represent ideal construction condition depending on the size of the facility, projected level of use of the facility and other operational factors. Lower cost construction approaches may also be appropriate, depending on the range of materials collected at the facility and operational characteristics of the facility.

#### 1. **Footings and Foundations**

Depending on the soil conditions, a typical footing and foundation construction consists of reinforced concrete to 150 mm above the grade and also extending well below the frost line.

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## 2. **Superstructure**

Steel frame construction should consist of steel columns, beams and open web steel joists with a 40 mm deep galvanized roof deck that is sloped in the direction of the drains.

## 3. **Exterior Walls**

The exterior walls should be constructed using cavity masonry design and should include concrete block, air-vapour barrier, insulation with thickness to meet code requirements, an air space and brick facing.

## 4. **Roof**

The roof should consist of built-up roofing and gravel with metal flashings, including vapour barrier, insulation with thickness to meet code requirements, 4 ply built-up roofing and gravel. Metal flashing can be (22 ga) .76 mm prefinished metal.

## 5. **Floors**

The floors should be constructed of concrete slabs on well compacted granular fill, with a steel reinforced and steel trowel finish. Additional reinforcing and hardener should be applied in areas designated for fork-lift use. All floors should also be slip resistant.

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**6. Partitions**

In the processing area, the storage area and the washrooms, the partitioning walls should be constructed of concrete blocks, extending to the underside of the roof deck. The office area and other staff areas can be constructed using drywall and steel studs. Wall thickness will depend on the heights and the fire rating requirements of the building.

**7. Blow-out Walls**

Blow-out walls should be built into the design of specific storage areas, such as the 'Flammable Storage Area'.

**8. Ceilings**

Suspended acoustical ceilings should be provided in the office area only.

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## 9. **Doors and Frames**

To a limited extent the location of doors, frames and hardware can be designed to suit the facility's individual needs; however, the following design criteria should be taken into consideration:

- fire rated doors, frames and hardware must meet the building's fire code classification;
- the man doors should be constructed with hollow metal material and a 1.5 mm galvanized wire coating. These doors should be equipped with panic bars to facilitate opening the doors in an emergency.
- overhead doors should be electrically operated roller steel shutter, complete with chains and locks and other safety features;
- the frames used to form the main doors should be constructed with hollow metal material and a 1.5 mm galvanized wipe coating; and
- the frames for the overhead doors should consist of steel.

## 10. **Windows**

Extension windows should be constructed of thermally-broken, anodized aluminum, with extruded aluminum sills.

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## 11. Canopy

A canopy should be constructed to extend over the customer drive-through area to prevent rainwater from spilling into the spill containment area. The underside of the canopy should be finished with pre-finished metal siding (5,000 series).

### 2.3.4 Functional Floor Plan

#### 1. Storage Areas

The building design may take into consideration six basic waste type classifications by designating separate storage areas separated by either dikes, curbing, or walls.

The six storage areas are as follows:

- Acid Corrosive Storage Area;
- Base Corrosive Storage Area;
- Flammable Storage Area;
- Toxic Storage Area;
- Oxidizer Storage Area; and
- Non-Hazardous Storage Area.

Other storage options may also be available that ensure worker safety and environmental protection, and which also incur less cost than separate storage. For example, storage cupboards or other secondary containment may suffice for miscellaneous waste types such as acids, bases and toxics.

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The size of each storage area depends to a large extent on the quantities and types of wastes received at the facility; however, the sizes of the storage areas need not be equal. The sizes should reflect the relative proportions of hazardous waste received at the facility.

Storage areas can be designed to accommodate a variety of materials, the characteristics of which will require appropriate segregation of the waste materials. The following factors will affect the storage area requirements:

- bulking of hazardous wastes, where applicable;
- frequency of pick-up;
- reporting requirements for storage longer than 3 months;
- generation rate of household hazardous wastes for the serviced population;
  
- anticipated capture ratio. Where the ratio is not known, it can be assumed to be 80% of the estimated generation rate;
- space and/or shelving requirements for materials to be stored; and
- ramps over curbs, where required.

## 2. **Work Areas**

The work area should be designed to incorporate a number of functions ranging from administration to waste handling. Some tasks can be performed in a common area, for example the sorting and bulking of incoming wastes can be conducted in the same work area. The facility design includes the following work areas:

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- General open/common area, where sorting and handling of waste is performed;
  - Bulking area, which must provide adequate space and air changes to accommodate bulking activities, and adequate space for storage of bulk containers and side draft fume hood; as stipulated by the Ontario Building Code and the Occupational Health & Safety Act and Regulations for Industrial Establishments - Revised Regulations of Ontario, 1980, Regulation 692;
  - Lab, which provides adequate space for lab equipment, lab benches and a fume hood;
  - Office;
  - File storage area for maintaining inventory, material data, etc.;
  - Aisles and hallways for movement of materials, sized for optional forklift operation and other equipment; and
  - space for drums of spill clean-up materials.
-

### 3. Service Areas

The facility design should also accommodate the following service areas:

- Mechanical/electrical room for power panel, fire water riser, domestic water meter, and possible heating, ventilation and air conditioning (HVAC) equipment.

### 4. Staff areas

Depending on the location of the permanent household hazardous waste facility the following staff areas may be considered:

- Lunch room;
  - First Aid room;
  - Men's and Women's change rooms and showers, equipped with lockers, benches and vanity services; and
  - Men's and Women's washrooms.
-

### 2.3.5 **Building Services**

The heading 'building services' encompasses a wide range of utility services that are vital to the operation of the facility. The function of the facility will require strict adherence to codes and standards for the installation of the utility services. The following items should be considered:

#### 1. **Domestic water and sewer**

- Distribution to showers, washrooms, eyewash stations, lab, lunchroom (optional)
- Waste demand requirement to be specified.

#### 2. **Electrical service and wiring**

- Voltage to suit site conditions and equipment requirements
  - Explosion proof wiring and fixtures/fittings in storage and bulking areas
  - Electric heat
    - distributed control by thermostat
    - baseboard or convection supplement to supply air heat for staff areas
-

- Lighting
  - high level lighting to office standard in work areas
  - lower level lighting in storage/warehouse areas
  - exterior wall mounted security lights
- Outlets (120 V) in lab, lunchroom, and office
- Equipment power
  - HVAC equipment including fume hood
  - sprinkler booster pump, if needed
  - forklift battery charger

3. **Drains from hazardous waste storage and bulking areas**

Separate drains situated in the bulking area and each storage area should drain to an individual sump located in each area or to the sump in the loading/unloading area. The sumps should be emptied after any spill, be regularly monitored and the liquid contents periodically pumped out and properly treated and disposed.

4. **Ventilation and air conditioning recommendations**

Ventilation and air conditioning installations comprise an important health and safety feature of a household hazardous waste permanent facility. Specific considerations should be given to the following prior to installing a HVAC system:

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- ventilation rates should be in compliance with Ministry of Labour, and fire department requirements for both summer and winter weather conditions;
- approval may be required for what is discharged from the installation from the appropriate Ministry of the Environment regional director under Part II, Section 8 of the Environmental Protection Act;
- provisions should be made to allow for external ventilation control which will permit one air change prior to entry into the facility;
- climate controlled work areas should be designed to ensure comfortable working conditions, with room temperature ranging from 20° - 25°C year round;
- separate thermostatic control can be installed for the work and storage areas;
- supply and exhaust fans should be installed with considerations made to have the fans explosion proof; and
- a side draft fume hood shall be installed with an airflow and control system.

## 5. **Fire protection system**

The characteristics of the hazardous wastes stored in the facility require the installation of a sophisticated fire protection system that should be discussed and approved by the local Fire Chief. A wide range of fire detection and control equipment may be made available in the facility, including:

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- sprinklers and a booster pump;
- foam dispersal equipment, appropriate for most materials;
- chemical fire extinguishers;
- alarm devices;
- fire hydrants on or adjacent to the property;
- explosion proof lighting;
- flame detectors with a capacity to detect ultra-violet wavelengths; and
- self-illuminating signs notifying
  - No Smoking,
  - Chemical Storage,
  - Exit.

#### 2.3.6      **Equipment**

Equipment required in the facility will depend, to a large extent, on the size and function of the facility. The following should be considered:

- lab equipment, as specified by a chemist, should be equipped with benches, fume hoods, cabinets, and appropriate testing equipment;
  - office and lunchroom furniture;
  - materials handling and storage equipment, including:
    - forklift (optional),
    - hand operated pallet cart(s),
    - dollies,
-



- containers to transfer waste materials from program participants to the building,
  - 45 gallon drums,
  - storage shelves, and
  - pallets to permit stacking of drums.
- side draft fume hood for bulking area and lab; and
- office equipment, including:
  - computer and printer,
  - fire proof filing cabinet, and
  - miscellaneous office supplies.

### 2.3.7      **An Overview of Building Costs**

The following section details the estimated costs involved in constructing a permanent facility in the size of 380 m<sup>2</sup>; as indicated in Section 2.1, this size of facility would serve the household hazardous waste requirements generally associated with a municipality with a population of 300,000 people. These costs are based on the building blueprint design provided in this manual. Costs are not included for exterior landscaping, roads and exterior lighting requirements since the range of necessity and sophistication varies greatly depending on the siting of the facility. Overall, the cost to construct a fully functional permanent household hazardous waste facility based on a generic blueprint design is estimated at \$664,500. The disaggregated costs are as follows:

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**STRUCTURE AND ARCHITECTURAL FINISHES**

FOOTINGS AND FOUNDATIONS	\$ 37,000
SUPERSTRUCTURE	\$ 90,000
EXTERIOR WALLS	\$ 98,000
ROOFING	\$ 31,000
FLOOR	\$ 58,000
PARTITIONS	\$ 50,000
CEILING	\$ 3,000
DOORS	\$110,000
WINDOWS	\$ 10,000
FINISH CARPENTRY	\$ 1,000
MISCELLANEOUS	\$ 2,000

SUBTOTAL	\$480,000
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<u>MECHANICAL</u>	\$129,000
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<u>ELECTRICAL</u>	\$ 55,500
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TOTAL COST	\$664,500
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**2.3.8 Cost Reduction Measures**

Smaller communities may wish to consider alternative measures to reduce the costs of designing and constructing a sophisticated permanent facility. It should be kept in mind, however, that as the features of the facility design are modified so too is the facility's ability to serve the

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community. Health and environmental safety practices must not be compromised. Suggested cost reduction measures include the following:

- Supervisory and technical personnel can be kept to a minimum by locating the permanent facility within the confines of other municipal waste management facilities.
  - The permanent facility can be located at a Public Work's yard, transfer station, sewage treatment plant, landfill site in which personnel change rooms, offices, lunch room and first aid room are already provided. Provisions for these service rooms in adjacent buildings eliminates the need to incorporate them into the permanent facility design. In addition, the reception area may also be located in an adjacent municipal building.
  - Storage areas can be reduced in size depending on the estimated storage needs of the facility. Volumes of household hazardous waste material collected during previous collection day events can be used to determine storage needs.
  - As indicated in Section 2.3.4, storage cupboards or other secondary containment may suffice in a single area for various waste types such as acids, bases and toxics.
  - As discussed in Section 5.4.7 - batteries can be stored outside in order to save valuable storage space inside the facility.
-

- Bulking of waste, where applicable, will help to reduce storage space requirements.
  - Provisions made to construct a canopy over the waste receiving and loading areas should eliminate the need to install a sophisticated drainage system and filtering system to collect and isolate rain water from accidental chemical spills. Any spill occurring under a canopy can be contained and drained to underground spill containment tank.
  - The exterior loading dock pit is optional assuming that the waste handling company has suitable loading equipment to accommodate ground level loading activities.
-

### 3.0 FACILITY APPROVAL AND DOCUMENTATION

#### 3.1 Overview

Any municipality wishing to offer household hazardous waste collection services must become familiar with documentation requirements. Documentation serves several purposes from permitting the siting and operation of the permanent household hazardous waste facility to eliminating the potential for waste handling and disposal violations. Facility operators must also ensure that emergency and routine procedures are referenced.

As a transfer station under the Environmental Protection Act and a generator of hazardous waste (under O. Reg. 347) the facility is subject to a variety of regulatory procedures. This section presents the necessary facility documentation requirements including requirements for a Certificate of Approval, the generator registration number and the waste manifest system.

#### 3.2 Relevant Legislation

The operator of the household hazardous waste facility must be familiar with the following pieces of environmental legislation which govern the operations and management of any household hazardous waste disposal facility and the hazardous wastes handled within.

- Environmental Protection Act - All generators of waste must assume responsibility and liability for the management of their waste under Part V of the Environmental Protection Act (EPA).

Section 13.1 of the Environmental Protection Act states:

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"Notwithstanding any other provision of this Act or the regulations, no person shall discharge a contaminant or cause or permit the discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect".

In order to legally operate a household hazardous waste facility, a municipality must have a Certificate of Approval.

Section 39 of the Environmental Protection Act states:

*"No person shall deposit waste upon, in, into or through any land or land covered by water or in any building that is not a waste disposal site for which a certificate of approval or a provisional certificate of approval has been issued and except in accordance with the terms and conditions of such certificate". R.S.O. 1980, c. 141, s. 39*

- Regulation 347, which falls under Part V of the Environmental Protection Act dealing with the management of waste material, stipulates stringent transportation and disposal procedures for liquid industrial and hazardous waste, also referred to as 'Subject Waste'. Generators, carriers and receivers of hazardous waste must comply with registration and waste manifest requirements. This "cradle-to-grave" approach provides the necessary means of tracing a hazardous waste from the point of generation through to proper disposal. However, Regulation 347 exempts a number of hazardous wastes from the management procedures that would otherwise be required. These exemptions are summarized in Table 3-1, and include:

- 1) **Household Hazardous Waste Exemption** - Under the heading Domestic Waste, all household hazardous wastes are exempt from the generator handling and
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disposal requirements stipulated in O. Reg. 347 at the point that they are generated (e.g. in the home). However, this exemption does not extend to facilities where these wastes are collected and does not pertain to hotels, motels or institutions, e.g. schools, government offices and hospitals, but does pertain to nursing homes, rest homes or professional dental and medical offices as defined by the Regulation.

## 2) **Small Quantity Exemptions**

- Acute Hazardous Waste - Registration is not required if the generator produces less than one kilogram per month or does not accumulate more than one kilogram of acute hazardous waste in any time period.
  - Hazardous Waste - Registration is not required if the generator produces less than five kilograms per month of a hazardous waste or does not accumulate more than five kilograms in any time period.
  - Liquid Industrial Waste - Registration is not required if the generator produces less than twenty-five kilograms per month of a liquid industrial waste or does not accumulate more than twenty-five kilograms of a liquid industrial waste in any time period.
  - It should be noted that smaller commercial/industrial generators of liquid industrial and/or hazardous waste who are exempt from the generator registration requirement of O. Reg. 347 by virtue of small quantities but wish to utilize permanent HHW facilities to manage their wastes; are not
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exempt from O.Reg. 347 and the waste management system Certificate of Approval requirement under Part V of the Environmental Protection Act. The Ministry of the Environment is investigating options for acceptance of these wastes at such facilities.

**3) Additional Exemptions**

- Spills - The same exemption applies to spills that contain those amounts of hazardous or liquid industrial waste outlined above under the Small Quantity Exemptions.
  - Containers and Liners - Empty containers or inner liners may or may not be exempt depending on the characteristic of the material they contained. Generally, all empty containers and liners that have been used to contain liquid industrial and hazardous waste are exempt from generator registration requirements. Exemption also applies to acute hazardous waste containers and liners in which the empty container is less than twenty litres capacity or the liners in total weigh less than ten kilograms.
  - Agricultural Wastes - All waste, including pesticides, relating to farm operations are exempt from the management requirements of Regulation 347. These wastes may result from the following activities:
    - spraying operations,
    - food packaging,
    - food preserving,
-



- animal slaughter, and
- meat packaging.

The Pesticides Act regulates the handling of pesticides used for farm operations.

- PCB (Polychlorinated Biphenyl) Waste - PCB liquids are not subject to generator registration requirements of O. Reg. 347 if:
    - wastes contain PCBs at a concentration of less than 50ppm;
    - individual electrical or other equipment (e.g. heat transfer, fluorescent fixture ballasts, or hydraulic equipment) contain less than one kilogram of PCBs; or
    - PCBs are used in machinery or equipment intended to destroy the chemical composition of the substance (equipment must be operated under a certificate of approval).
  - Nursing Homes, Rest Homes, Professional Dental and Medical Offices - "Subject" wastes are exempt from generator registration requirements.
  - Retail Motor Vehicle Service Station - Registration is not required for "subject" waste if the station has a written agreement for the collection and handling of the waste from a waste management system approved under Part V of the Environmental Protection Act (EPA).
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**TABLE 3-1**  
**REGULATION 347**  
**WASTE CLASSIFICATIONS AND EXEMPTIONS**

<b>WASTE</b>	<b>EXAMPLES</b>	<b>EXEMPTIONS</b>	<b>CONTAINERS/LINERS</b>	<b>NOTES</b>
Severely Toxic Waste	dioxins, furans	NONE	Considered hazardous.	
Pathological Waste	animal carcass, human body parts, disease infested wastes	NONE Pathological waste from nursing homes, rest homes, and dental and medical offices are not exempt.	Considered hazardous unless sterilized, incinerated, or autoclaved.	
PCB (Polychlorinated biphenyl) Waste	PCBs	<ul style="list-style-type: none"> <li>- less than 50 ppm;</li> <li>- in electrical/heat transfer or hydraulic equipment or any other containing &lt;1 kg;</li> <li>- used in machinery or equipment used to destroy the chemical structure and having a C of A.</li> </ul>	Considered hazardous.	As of December 1988, road oil cannot contain PCBs.
Schedule 1 Hazardous Industrial Waste (subject waste)	Specific sources include: <ul style="list-style-type: none"> <li>- wood preservative</li> <li>- organic chemicals</li> <li>- inorganic pigment</li> <li>- inorganic chemicals</li> <li>- pesticides</li> <li>- explosives</li> <li>- vet. pharmaceuticals</li> <li>- ink formulation</li> </ul>	<ul style="list-style-type: none"> <li>- &lt;5 kg generated per month or accumulated over any period of time.</li> <li>- sewage sludge</li> <li>- hauled sewage</li> <li>- domestic waste</li> <li>- agricultural waste</li> <li>- clean up from a spill containing &lt;5 kg of this waste.</li> </ul>	Empty containers and liners are exempt.	<ul style="list-style-type: none"> <li>- Waste from hotels, motels and institutions are not exempt.</li> <li>- Pesticides from farms are regulated under the Pesticides Act.</li> <li>- Includes research or experimental facilities laboratories, medical clinics, schools and hospitals.</li> </ul>

**TABLE 3-1 CON'T  
REGULATION 347  
WASTE CLASSIFICATIONS AND EXEMPTIONS**

<b>WASTE</b>	<b>EXAMPLES</b>	<b>EXEMPTIONS</b>	<b>CONTAINERS/LINERS</b>
Schedule 2A Acute Hazardous Waste	- mainly commercial chemical products and manufacturing intermediates.	- <1 kg generated per month or accumulated over any period of time. - clean up from a spill containing <1 kg of this waste.	- empty container of less than 20 litres capacity or with liners weighing less than 10 kg in total.
Schedule 2B Hazardous Waste Chemicals	- specific inorganic and organic chemicals and pharmaceutical wastes.	- <5 kg generated per month or accumulated over any period of time. - clean up from a spill containing <5 kg of this waste.	Considered non-hazardous.
Ignitable Waste, Corrosive Waste, Reactive Waste, Leachate Toxic Waste.	- must meet specific conditions outlined in the Regulation.	- <5 kg generated per month or accumulated over any period of time. - clean up from a spill containing <5 kg of this waste.	Considered non-hazardous.
Liquid Industrial Waste (subject waste)	- liquid waste from industry, commercial, manufacturing, research or experimental activities. - wastes that fail the slump test.	- <25 kg generated per month or accumulated over any period of time. - spills are not considered "hazardous" - hauled sewage - sewage sludge - food processing waste	Considered non-hazardous.

- **Recyclable Material** - Essentially this definition refers to any liquid industrial and hazardous waste, as well as any other waste covered under the "Subject Waste" classification that is 1) intended for use in a process other than waste management, 2) to be directly packaged for resale, and 3) offered for retail sale to meet realistic market demand. Furthermore, the intended use cannot involve combustion/incineration or land application. To comply with the Regulation's requirements the liquid industrial and hazardous waste must pass directly from generator to end user or retailer without passing through a transfer station or any other intermediary transfer point.

It is likely that a Certificate of Approval for a household hazardous waste facility will exclude or restrict some materials. These include PCB wastes, pathological waste and radioactive wastes as these materials are defined in the legislation.

### 3.3 **Routine Documentation Procedures**

As with all other facilities involved in the management of hazardous wastes, the owner of the household hazardous waste facility must apply to the Ministry of the Environment for approval to operate and manage the incoming hazardous waste materials. The application procedures are very detailed and regimented.

#### 3.3.1 **General Responsibilities**

Under the Environmental Protection Act the ownership of waste that is accepted at a waste management site by the operator of the site is transferred to the operator upon acceptance. Once

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a waste has been received, the operator of the facility is considered the owner of the waste and consequently is responsible and liable for the safe management of the waste.

No owner of hazardous waste, as defined by Regulation 347 under the Environmental Protection Act, may allow the waste to pass beyond their control or to leave their facility unless the waste is transferred by a certified transportation company (carrier) to a certified disposal company (receiver) under the control of the waste manifest system.

### **3.3.2 Certificate of Approval Requirements**

A Certificate of Approval must be obtained for the operation of the household hazardous waste facility. Application forms are available from local district offices of the Ministry of the Environment. At its discretion, the Ministry of the Environment has the right to request a hearing by the Environmental Assessment Board. The proponent should meet with local MOE district office/regional staff to discuss details of the proposed facility and to obtain any additional information required to be submitted with the application. The completed application is to be returned to the local district office.

All wastes targeted for collection at the household hazardous waste facility must be identified in the application for a Certificate of Approval. Only those wastes listed in the Certificate of Approval can be accepted at the facility. The Certificate requests an annual submission of waste types and quantities received during the calendar year as well as a summary of their ultimate disposal.

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### 3.3.3 Contingency Plans

Under extenuating circumstances, a household hazardous waste facility may be required to accept materials that do not comply with the terms and conditions of the Certificate of Approval in order to ensure the proper management of a waste.

Special consideration must be given to those wastes entering the household hazardous waste facility that are not covered under the Certificate of Approval or have an unknown identity. To cover this situation, the owner/operator of the facility must submit a contingency plan in the Certificate of Approval application stipulating the appropriate measures to be taken if this situation should arise. The contingency plan should include the following procedures:

- immediate recognition of a violation, followed by the identification of the generator;
- segregation and isolation of the waste;
- notification of the violation to the appropriate staff member at the local District Office of the Ministry of the Environment;
- priority testing of the waste, as necessary, to identify its composition;
- maintenance of all waste type violations records.

Municipalities must ensure that due diligence is taken to discourage contravening activities. Municipalities should also initiate adequate educational activities to inform the participants about the conditions for receiving the household hazardous wastes.

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### 3.3.4 Registration Requirements

All hazardous waste generators, as defined by O. Reg. 347, must complete and submit a Generator Registration Report to the Ministry of the Environment. Generator registration reports can be obtained from local MOE district offices. In order to manage household hazardous wastes at a household hazardous waste facility, a municipality must be registered as a generator of hazardous waste under O. Reg. 347. Larger municipalities with more than one household hazardous waste facility require a separate Generator Registration and Certificate of Approval for each facility.

The generator must include a detailed description of the wastes expected to be collected on-site. The reporting requires a general description of the identity and general physical and chemical characteristics of the waste, estimated quantities and a best-fit waste classification code. The Generator Registration Report also requires an identification of the intended certified waste management carrier and receiver.

Following registration with the Ministry of the Environment, the generator will receive a letter of acknowledgement which provides the registration number for the household hazardous waste facility and a list of registered wastes at the facility. Once registered, a generator is only required to re-register with the Ministry of the Environment if there is a change in the information originally submitted to the Ministry. A supplementary Generator Registration Report must be submitted to the Ministry within 15 days after the change has occurred. Shipment of the waste cannot resume until a new generator registration document has been issued by the Ministry.

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### **3.3.5 Waste Manifest Requirements**

A Generator Registration Number must be acquired from the Ministry of the Environment in order to ship wastes. The number is issued by the Ministry along with the letter of acknowledgement. Separate manifests must be completed for each waste generating facility (site) or in this case for each household hazardous waste facility. A manifest must be completed for all shipments of waste from each facility. Generators are responsible for ensuring that carriers are certified and the treatment and disposal facility has Ministry approval. Carriers can only accept those wastes for which a manifest has been completed. The operator of the facility must be present during the pick-up service provided by the carrier and until the service is completed. All parties involved in the transaction must keep a copy of the manifest for a two year period.

### **3.3.6 Additional Information**

Inventories of all incoming and outgoing wastes must be conducted at the facility. These inventory records must be kept on file for a two year period. Where storage of hazardous wastes beyond a three month period is undertaken, the generator should notify the Regional Director of the Ministry of the Environment in writing of the storage activity within 5 working days following the initial three month period.

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## 4.0 FACILITY OPERATIONAL SAFETY GUIDELINES

### 4.1 Overview

The day-to-day operation of any facility involved in the handling and storage of hazardous substances must adhere to recognized safety procedures designed to ensure the health and safety of the facility's employees and the public at large. These operational safety procedures, when implemented in conjunction with suitable building design, use of specialized mechanical and electrical equipment, and product containment standards, should create a working environment in which there is minimal risk of injury or environmental contamination.

All phases of the operation must be evaluated for potential health, safety and environmental concerns to facilitate development of effective work, safety and emergency response procedures. Specific items of concern that should be addressed during the evaluation include:

- a) safe handling procedures during receipt, storage and disposal of wastes;
- b) employee protection;
- c) segregation and storage of wastes;
- d) use of specialized equipment and/or processes;
- e) emergency response;
- f) spill containment and clean up;
- g) training;
- h) security;

The resulting facility design, work practices and safety procedures must also address the applicable workplace legislative requirements in order to ensure regulatory compliance.

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## 4.2      **Relevant Legislation**

Numerous Ministries have control over one or more aspects of health and safety matters. Table 4-1 summarizes the relevant legislation and ministerial responsibility. The two most prevalent pieces of legislation governing health and safety issues are as follows:

- Occupational Health and Safety Act - Workplace safety, including control of exposure to toxic substances, falls within the jurisdiction of the Occupational Health and Safety Act and its regulations, administered by the Ministry of Labour. The Regulations for Industrial Establishments, applicable to the household hazardous waste facility, detail minimum safety standards for the operation of the facility and include provisions for employee protection, accident prevention and reporting, emergency response, control of exposure to toxic substances and training. Maximum acceptable levels of exposure to a wide variety of toxic substances are also specified in the Regulations respective to Control of Exposure to Biological or Chemical Agents (O.Reg.654/86) also administered under the Occupational Health and Safety Act.
  - Environmental Protection Act - Chemical spills are subject to Part IX of the Environmental Protection Act, administered by the Ministry of Environment. Specific sections of this part of the Act require notification to the MOE of any chemical spill which enters or is likely to enter the natural environment. In addition, the person in control of the spill is to take all necessary steps to control, contain and cleanup the spill. The affected area must also be restored to its original condition prior to the spill.
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TABLE 4-1  
RELEVANT LEGISLATION

<b>ACT</b>	<b>LEGISLATION</b>	<b>MINISTRY RESPONSIBLE</b>	<b>COMMENTS</b>
Environmental Protection Act	Regulation 347 "General Waste Management"	Ministry of the Environment	<ul style="list-style-type: none"> <li>- sets mandatory Certificate of Approval requirements for siting and operation of a facility</li> <li>- identifies registration requirements for generators of hazardous waste above a specified amount</li> <li>- establishes reporting requirements for waste storage time limits</li> <li>- governs the waste manifest system</li> </ul>
	Regulation 308 "General Air Pollution"		<ul style="list-style-type: none"> <li>- governs acceptable operating conditions with regards to air quality</li> <li>- controls the maximum concentration of air contaminants</li> </ul>
	Environmental Protection Act Part IX "Spills"		<ul style="list-style-type: none"> <li>- In the case of a spill, makes the person/s in charge responsible for notifying the appropriate authorities and taking necessary remedial actions</li> <li>- identifies spill classification and exemptions</li> <li>- sets out provisions for compensation from a spill</li> </ul>
Occupational Health and Safety Act	Regulation 643/88 & 644/88 "Workplace Hazardous Materials Information System (WHMIS)"	Ministry of Labour	<ul style="list-style-type: none"> <li>- provides workers and communities with the right to know about hazardous material conditions in the workplace</li> <li>- provisions set for maintaining an inventory of all hazardous materials in the workplace and labelling hazardous containers</li> <li>- requires creation and update of material safety data sheets</li> <li>- sets guidelines for providing workers with training and instruction in handling hazardous materials</li> </ul>
	Regulation 692 "Regulations for Industrial Establishments"		<ul style="list-style-type: none"> <li>- provides minimum standards related to health and safety provisions in the industrial design and operation of a building</li> </ul>

TABLE 4-1 CONT'D  
RELEVANT LEGISLATION

ACT	LEGISLATION	MINISTRY RESPONSIBLE	COMMENTS
Building Code Act	Building Code	Ministry of Municipal Affairs and Housing	- defines specific requirements for building construction and installation of fire control measures and other safety related structures and facilities
Fire Marshals Act	Regulation 730/81 "Fire Code"	Ministry of the Attorney General	- specifies minimum requirements for provision and replacement of fire control equipment and storage of flammable goods
Gasoline Handling Act		Ministry of Consumer and Commercial Relations	- sets standards for the insulation, use and maintenance of underground and above ground storage tanks containing fuel
Pesticides Act	Regulation 751	Ministry of the Environment	- takes precedence over the Environmental Protection Act and Regulation 309 with regards to storage, handling and management of pesticides
Transportation of Dangerous Goods Act		Federal Government - Transport Canada	- sets standards for packaging, labelling, handling and transportation requirements for the transportation of dangerous goods.

Other legislation and regulations affecting the operational and safety requirements of the facility include:

- Building Code - defines specific requirements for building construction and installation of fire control measures and other safety-related structures and facilities.
  - Fire Code - specifies minimum requirements for provision and placement of fire control equipment and storage of flammable goods.
  - Gasoline Handling Act - regulations governing the installation and maintenance of below and above-ground tanks containing fuel and fuel-related products.
  - Pesticides Act - specifies procedures for storage and disposal of pesticides and containers originally containing pesticides.
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#### 4.3 **Operational Safety Procedures**

The development of safety standards and procedures and provision of specialized protective and emergency equipment should take into account the nature of the materials being handled, methods of handling and storage, degree of hazard associated with each material and volumes accumulated. Site specific safety procedures, emergency procedures, emergency equipment and safety and emergency equipment usage should be discussed with and approved by local Fire Department and Ministry of Labour personnel.

##### 4.3.1 **Personal Protective Equipment (PPE)**

The use of PPE is an essential part of a safety program in a facility where hazardous substances are routinely handled. The requirements for use of the PPE and degree of protection will depend on the type of materials being handled, method of handling and engineering controls in place. The Occupational Health and Safety Act specifies the requirement to reduce exposure through the use of engineering controls, however, in situations where this is not practical or possible, the appropriate protective devices and equipment must be employed.

Proper care and maintenance of the PPE will ensure that the equipment is hygienically safe and provides the maximum level of protection, as designed. Provisions must be made for:

- regular training in the use and maintenance of PPE;
  - storage of PPE in dry, dust-free cabinets;
-

- individual issue of respirators, gloves, hardhats, safety goggles, face shields, chemical resistant safety suits and boots;
- cleaning of respirators on a regular basis;
- inspection of respirators on a daily basis;
- individual fit-testing of respirators; and
- immediate replacement of torn, ripped or punctured gloves, boots and coveralls.

Respirators should be NIOSH approved and must utilize purifying cartridges certified for use in the presence of the specific type(s) of dusts, gas or vapour being liberated.

#### **4.3.2 Emergency Equipment**

Sufficient emergency response equipment should be installed in the facility to provide initial response to an emergency and protect the employees and other personnel in the immediate vicinity. This equipment should provide sufficient resources to control and eliminate small-scale emergencies and provide protection to the employees during an evacuation forced by large-scale emergency situations.

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The minimum recommended inventory of equipment includes:

- first aid kit that satisfies Workers' Compensation Board requirements;
- stretcher;
- fire blanket;
- fire extinguishers - minimum of two 10 lb ABC type units;
- deluge shower - in vicinity of liquid dispensing stations;
- eye wash station - in vicinity of liquid dispensing stations and other areas where corrosive liquids and organic solvents are handled;
- self-contained breathing apparatus (SCBA) to be used only by qualified staff who have been specially trained in its use and have maintained their qualification.
- chemical burn kit.

Equipment and supplies to contain and absorb liquid spills should include:

- Sorball, vermiculite, or other similar absorbent material - minimum 4 bags;
  - Oil spill pads or oil absorbent for furnace, motor or other oil spills;
-



- Soda ash or lime for acid spills - minimum 2 bags;
- Boric acid crystals for caustic spill;
- 205 L open-topped drums with lid and locking ring to contain the absorbent;
- Square blade shovel and broom;
- Wet sand for emergency drying; and
- Overpack drums along with absorbent (e.g. sorball).

The emergency equipment and spill containment materials should be stored in clearly marked cabinets and in a readily accessible area of the facility least likely to be affected by an emergency situation. All other emergency devices should be clearly identified by the appropriate signs. Deluge showers and eyewash stations must be readily accessible. One of each unit should be located in each area that is physically separated by barriers or walls.

#### **4.3.3 Hygiene Facilities**

The provision of adequate facilities for personal hygiene is a requirement for any facility where staff are employed on a regular basis. In a facility such as the HHW collection facility, there is a requirement to provide additional hygiene facilities to supplement the standard toilets, wash basins and drinking water requirements. The Occupational Health and Safety Act requires that, where there is the potential for skin contamination or presence of substances which are poisonous by ingestion, provision must be made for showering and separation of work clothes from street

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clothes. In order to satisfy all of these requirements, the minimum inventory of facilities should include:

- one toilet facility offering reasonable privacy;
- one wash basin with hot and cold water;
- a male and female shower room;
- one set of two lockers for street and work clothes for each employee;
- hygiene supplies such as soap and paper towels or other drying media; and
- one drinking water supply (fountain or tap).

All rooms providing these facilities should be vented outdoors and be provided with a minimum of ten air changes per hour.

#### 4.3.4 **Operating Procedures**

Daily operating procedures should be defined such that the receipt, identification and transfer to storage of hazardous liquid wastes is performed in a safe and efficient manner. These procedures should be clearly and concisely documented and integrated into the facility operations manual for ready reference by all staff. These operation procedures are further discussed in Section 5.0 - Waste Management Guidelines.

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Specific procedures to be addressed should include:

- receipt and documentation of wastes;
- guidelines for establishing acceptance of specific wastes;
- analytical requirements and methods;
- segregation of wastes;
- methods of storage and containment; and
- maintaining inventory records.

#### 4.3.5      **Emergency Procedures**

Development and implementation of emergency response procedures for all potential emergencies should be considered an essential part of the operation of a hazardous waste collection facility. Procedures should be drawn up and posted in key locations in the building for:

- fire;
  - personal injury;
  - release of toxic vapours and gases;
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- chemical spills (liquid and solid); and
- explosion.

Development of the specific procedures should include an assessment of the potential for an occurrence, areas most likely to be affected and, based on types and volumes of materials present, the severity of potential emergencies. Local agencies such as the fire and police departments and provincial authorities including the MOE and Ministry of Labour should be consulted during the formulation of the procedures to ensure that the specified responses can be integrated into official emergency plans already in effect in the municipality.

Each of the procedures should include information regarding:

- initial response to the emergency;
  - methods of control, if practical;
  - protective equipment and emergency supplies;
  - containment and cleanup procedures for chemical spills;
  - list of personnel and agencies, including phone numbers, to be notified; and
  - reporting requirements following cessation of the emergency.
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#### 4.3.6      **Emergency Documentation**

To reduce confusion during an emergency, the staff must be well acquainted with the emergency procedures and contingency plans for the household hazardous waste facility. Documentation must be posted in appropriate places, such as beside every telephone, and next to emergency exits. In the case of an emergency the following documentation must be available:

- a list of names, addresses and phone numbers of the emergency response contacts:
    - fire department,
    - police department,
    - ambulance service,
    - hospital,
    - Canutec; the federal Department of Transport's 24-hour emergency response centre (613) 996-6666,
    - Canadian Centre for Occupational Health and Safety, 1-800-263-8276,
    - Ministry of the Environment Spills Action Centre, (416) 325-3000,
    - Ministry of the Environment District Office,
    - Ministry of Labour,
    - Municipality,
    - carrier and receiver (on contract);
  
  - a list of health and safety equipment available on-site, as well as their location;
-

- specific contingency plans and procedures relating to the following emergency situations:
  - injury,
  - leaks and spills,
  - explosion,
  - fire;
- site layout plans;
- topographic map of surrounding area at a scale of 1:25000 or larger with identification of different land uses and water courses;
- Certificate of Approval documentation;
- Generator Registration Number and related documentation;
- Waste Manifest documentation.

In addition, arrangements must be made with local authorities so that in the case of an emergency the authorities are familiar with the following operational characteristics of the facility:

- site layout;
  - properties of the wastes;
  - number of employees and their responsibilities;
  - road entrances and emergency exits; and
  - site fire plan.
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#### 4.3.7      **Emergency and Operations Training**

The implementation of work plans, safety procedures and response to emergency situations can be effectively accomplished only if site personnel have been sufficiently trained in all aspects of the operation. Personnel actively involved in the operation of the facility must, in addition to displaying a thorough knowledge of the daily operating procedures of the site, be conversant with all safety requirements, environmental control and emergency response procedures. Specific areas of training should include:

- first-aid, including CPR;
- use of PPE, including respirators;
- use and maintenance of SCBA by trained staff;
- use of fire control equipment procedures;
- Transportation of Dangerous Goods; and
- Workplace Hazardous Materials Information System (WHMIS).

Although the facility is exempt from the regulatory requirements for WHMIS training, it is recommended that site personnel receive generic and site-specific training in order to thoroughly understand the chemical hazards associated with the operation.

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## 5.0 WASTE MANAGEMENT GUIDELINES

### 5.1 Overview

In any situation involving the generation or collection of hazardous substances, it is incumbent upon the owner or operator of the facility to operate the facility in an environmentally responsible manner. In addition to demonstrating compliance with applicable provincial and federal regulations, adherence to accepted waste management practices assures public confidence and provides for protection of the environment and the public at large.

Additional benefits of following sound waste management practices include a safer, cleaner work environment, and the perception by the public using the facility that the wastes being brought to the site will be handled in an environmentally safe manner. In view of increased public awareness and participation in environmental issues it is important that the public have this assurance.

### 5.2 Relevant Legislation

The regulatory responsibility for waste management in Ontario rests with the Ministry of the Environment. In order to establish the foundation for environmental protection, the Environmental Protection Act assigns responsibility to the general population to:

- restrict the discharge of contaminants to the environment to maximum levels as prescribed in the Act;
  - report all contaminant discharges to the MOE; and
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- undertake all reasonable measures to contain and control a discharge and initiate cleanup to return the environment to its original state prior to the discharge.

It should be noted that the environment, as it is referred to in this document, includes groundwater, surface waterbodies, soil and the atmosphere.

Numerous regulations have been enacted under the authority of the Environmental Protection Act to address specific areas of contaminant or waste control. Regulations impacting on the operation of a hazardous household waste collection facility include:

- O.Reg. 347 - Waste Management (General)
    - establishes procedures for the identification, documentation, shipment and disposal of liquid industrial and hazardous wastes;
  - O.Reg. 308 - Air Pollution
    - specifies maximum levels of contaminant discharge to the atmosphere;
  - O.Reg. 11/82 - Waste Management - PCBs
    - defines methods for handling and storage of PCB-contaminated equipment; and
  - Environmental Protection Act - Part IX
    - identifies procedures for the handling, reporting and cleanup of spills
-

Other related legislation and corresponding regulations or codes affecting the operation of the site include:

- Transportation of Dangerous Goods Act
  - specifies procedures for transportation of dangerous goods including wastes. Identifies common waste classification criteria to permit safe handling and transportation of hazardous waste;
- Gasoline Handling Act and Code
  - addresses the installation, use and maintenance of underground and above ground storage tanks containing fuel and fuel-related products; and
- Municipal/Regional Sewer-Use ByLaws
  - establish local or regional sewer bylaws controlling discharges of contaminants to sanitary and storm sewers.

### 5.3 **General Waste Management Procedures**

Waste management procedures should be established such that all classes of waste accepted by the facility are handled in a safe manner and in compliance with the Environmental Protection Act and its regulations and other applicable legislation, codes and bylaws. The protection of the site workers and public using the facility should be given high priority in the formulation of the waste management procedures.

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### 5.3.1      **Waste Handling**

The operation of a household hazardous waste collection facility necessitates the repeated handling of small quantities of a variety of waste classes such as acids, caustics, solvents, paints, pesticides, etc. In recognition of the varied types of wastes likely to be deposited at the facility, it is important to develop concise methods of handling and movement into temporary storage for each type of waste. Issues to be addressed should include:

- procedures for acceptance and documentation of the materials;
- methods of identification, characterization and laboratory testing, as required;
- safe-handling procedures;
- emergency response in the event of spills, accidents, etc;
- procedures for placing wastes into storage, ie. shelf storage, requirements for lab packs, bulking; and
- special precautions for bulking of specific wastes such as corrosive and flammable liquids.

### 5.3.2      **Standard Receiving Procedures**

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Procedures for the acceptance and documentation of the materials must be established to maintain consistency and accuracy in the handling and storage of the incoming waste materials. Directions for the receiving and documentation of the wastes should be well established:

- waste generators should drive up to the designated drop-off area and turn off the ignition of the vehicle.
  - employees receiving the waste must wear personal protective safety equipment and while unloading the vehicle must visually inspect the load for unlabelled containers. Unlabelled containers must be kept separate from the rest of the load and contingency procedures, outlined in Section 3.3.3 - Contingency Plans, must be followed.
  - during the unloading, the following information should be obtained from the generator and entered onto a "Material Registration Form":
    - name;
    - address;
    - municipality;
    - phone number;
    - vehicle licence plate number; and
    - waste types and estimated quantities.
  - after the load has been removed and visually inspected and the relevant forms completed, the client may leave.
-

### 5.3.3 Waste Containment

The prevention of spills or leakage to the environment is of utmost importance. Materials must not only be suitably contained in drums, tanks, or other appropriate container pending off-site disposal, but all materials must be effectively contained in the event of a spill or container leak. Factors to be considered in determining container requirements include:

- type of material to be stored - corrosive, flammable, etc.;
- volume of waste likely to be collected; and
- method of bulking, ie. pumping, pouring.

Determination of the above information will assist in the selection of the appropriate container and establishing whether the materials should be stored in above ground or below ground tanks, steel drums or simply placed on suitable shelves in the original containers.

The integrity of all storage containers must be maintained to prevent leakage. Inspection of the vessels or drums should be conducted on a regular basis and repairs undertaken as required. Should a spill or storage container rupture occur, effective spill containment devices must be in place in order to contain liquids to localized areas and allow for speedy and effective cleanup. This will necessitate the installation of liquid-tight berms around all areas used to store drummed materials, above ground storage tanks and pumping stations.

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#### 5.3.4 Storage Security

Security of the storage area is an important aspect of the site operation. The facility operator must be able to minimize the threat of vandalism and prevent unauthorized entry during off-hours. Provision should be made at the site for:

- outdoor perimeter lighting;
- fenced enclosure with locked gates for materials stored outdoors;
- security locks on all outdoor storage sheds;
- building locks tied into an alarm system; and
- bars or similar restrictive devices on windows.

#### 5.3.5 Waste Disposal

Disposal of accumulated wastes should be undertaken in a manner that satisfies all of the requirements of the Environmental Protection Act, O.Reg. 347 and the Transportation of Dangerous Goods Act. The following must be addressed in order to ensure compliance:

- reporting to the Regional Director if storage exceeds 3 months, unless the facility has approval under Part V of the Environmental Protection Act;
  - registration of all waste classes;
  - use of licensed waste haulers;
  - use of waste manifests;
-

- shipment of wastes to appropriately licensed receivers; and
- adherence to Transportation of Dangerous Goods Act with respect to labelling, placarding and appropriate documentation.

Transfer of the waste from storage areas to the truck or bulk carrier should be performed in a manner that provides for the protection of the workers and minimizes the risk of spillage. Provision should be made for:

- the appropriate protective equipment and devices for workers performing the transfer;
- availability of spill control and cleanup materials and equipment;
- use of trained personnel; and
- use of properly maintained transfer and pumping equipment.

Special consideration should also be given to the disposal of flammable liquids and include provision for:

- use of non-sparking tools for opening and closing drums;
  - use of specially grounded pumping equipment for bulk transfers; and
  - elimination of heat sources and posting of "no smoking" signs.
-



#### 5.4 Specific Waste Management Procedures

It is important that all waste material should be removed from incoming vehicles by a trained member of the household hazardous waste facility staff wearing appropriate protective clothing. In the past, some municipalities have used volunteer labour to remove household hazardous waste from incoming cars; this should only be done following appropriate training of volunteer staff and only after the facility operator has considered the liability risks that may be associated with this action. Materials should first be taken to the receiving area to be logged and characterized prior to being taken to the appropriate storage area.

Generally, there should be at least six designated storage areas. The floor should be coated with an impermeable sealant and slanted slightly towards a collection sump to contain any spills. The six storage areas are as follows:

- 1) Acid Corrosives Storage Area
    - acids, lead/acid batteries
  - 2) Base Corrosives Storage Area
    - caustic soda, hydroxides, oven cleaners
  - 3) Flammables Storage Area
    - solvents, oil-based paints, adhesives
  - 4) Toxics Storage Area
    - pesticides, herbicides, pharmaceuticals
-

- 5)     Reactives Storage Area
  - pool chemicals, hydrogen peroxide, fertilizer
  
- 6)     Non-Hazardous Materials Storage Area
  - latex paint, other non-hazardous materials.

Recyclables may be kept in the appropriate storage area but segregated from non-recyclable waste material. Signage should be used to designate the recyclable materials.

The waste handling, storage and disposal of specific waste streams is tabulated in Table 5-1 and summarized below.

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TABLE 5-1

## WASTE MANAGEMENT PROCEDURES FOR HAZARDOUS MATERIALS

<b>Hazardous Material</b>	<b>Primary Hazardous Characteristic</b>	<b>Special Handling Precautions</b>	<b>Analysis Required</b>	<b>Reuse/Recycle Possibilities</b>	<b>Disposal Options</b>
1. Acids <ul style="list-style-type: none"> <li>- sulphuric acid</li> <li>- muriatic acid</li> <li>- boric acid</li> </ul> Bases <ul style="list-style-type: none"> <li>- caustic soda</li> <li>- lye</li> <li>- hydroxide</li> </ul>	-corrosive	<ul style="list-style-type: none"> <li>-record product identification, quantity and date</li> <li>-verify identification with pH test if waste ID suspect</li> <li>-inspect container for leaks or corrosion and if necessary transfer to clean plastic container properly labelled with ID, date</li> <li>-transfer waste to appropriate acid or base storage area according to type of acid/base</li> <li>-DO NOT mix waste acid with metals, alkalis, cyanide or sulfide containing wastes</li> <li>-DO NOT mix waste base/alkalis with acids, flammable liquids, organic halogens, metals: Al, Sn, Zn or nitro compounds</li> <li>-DO NOT add water to waste acid or base</li> </ul>	-pH test	-none	-dispose with lab packs for neutralization at licensed TSD* facility
2. Solvents <ul style="list-style-type: none"> <li>- paint thinners eg. varsol</li> <li>- methylene chloride</li> <li>- acetone</li> <li>- etc.</li> </ul>	-ignitable -toxic	<ul style="list-style-type: none"> <li>-record solvent type, quantity, and date</li> <li>-establish whether solvent is CHLORINATED or NON-CHLORINATED from label or lab analysis if necessary</li> <li>-transfer waste to 'FLAMMABLE STORAGE AREA'</li> <li>-accumulate non-chlorinated solvents in 45-gal drum labelled 'WASTE NON-CHLORINATED SOLVENT'</li> <li>-accumulate chlorinated solvents in 45-gal drum labelled 'WASTE CHLORINATED SOLVENT'</li> <li>-open accumulation drum with non-sparking brass bung wrench only</li> <li>-keep away all ignition sources from area</li> <li>-DO NOT add any corrosives to any solvents</li> <li>-when accumulation drum becomes full remove to 'PRE-DISPOSAL AREA'</li> <li>-DO NOT stack ignitable wastes</li> </ul>	-if chlorine content suspect/unknown analyse for TOX or TOCI	<ul style="list-style-type: none"> <li>-recycling through distillation possible depending on quantity, &amp; no. of different solvents collected</li> <li>-if specific solvent is collected regularly and sufficient quantity should separate for recycling</li> </ul>	-dispose for incineration at licensed TSD facility

\* Treatment, Storage, Disposal

**TABLE 5-1 CONT'D**  
**WASTE MANAGEMENT PROCEDURES FOR HAZARDOUS MATERIALS**

<b>Hazardous Material</b>	<b>Primary Hazardous Characteristic</b>	<b>Special Handling Precautions</b>	<b>Analysis Required</b>	<b>Reuse/Recycle Possibilities</b>	<b>Disposal Options</b>
3. Paint - oil-based	-oil-based paints combustible -contain heavy metals	-remove unopened or useable paint for redistribution -record waste paint type, quantity and date -transfer waste oil-based paint to 'FLAMMABLE STORAGE AREA' -accumulate waste oil-based paint in drum or tank (dependent on regular quantities received) labelled 'WASTE OIL-BASED PAINT'	-if paint type unknown determine flash point -If contamination suspected conduct TOX and possibly PCBs test	-Ladlaw is currently studying paint recycling but still at research stage -problems with recycling are contamination and inconsistent properties	-disposal for incineration at licensed TSD facility -possibly used as secondary fuel
- latex		-remove unopened or useable paint for redistribution -record waste paint type, quantity and date -transfer waste latex paint to 'NON-HAZARDOUS STORAGE AREA' -accumulate waste latex paint in tank or drum (dependent on regular quantities received) labelled 'WASTE LATEX PAINT'			
4. Oil -motor oil from do-it-yourselfer oil changes	-can contain heavy metals	-record oil source, quantity and date -transfer waste oil to 'NON-HAZARDOUS STORAGE AREA' -accumulate waste oil in 500-gal tank labelled 'WASTE MOTOR OIL' -stored outside	-if source of oil is unknown or contamination suspect test for PCBs and GC-FID ID check	-used motor can be recycled if sufficient quantity is collected by Breslube -recycler pumps out contents of tank into truck	-if insufficient quantity dispose for incineration at licensed TSD facility or use as secondary fuel
5. Herbicides/ Pesticides - DDT - 2,4,5 T - dieldrin	-toxic -may contain dioxin	-record product identification, quantity and date -inspect container for leaks or corrosion and if necessary transfer to clean plastic container properly labelled with ID, date	-if waste is unknown conduct set of ID characterization tests eg. GC, miscibility etc.	-none	-dispose with lab packs at licensed TSD facility

**TABLE 5-1 CONT'D  
WASTE MANAGEMENT PROCEDURES FOR HAZARDOUS MATERIALS**

<b>Hazardous Material</b>	<b>Primary Hazardous Characteristic</b>	<b>Special Handling Precautions</b>	<b>Analysis Required</b>	<b>Reuse/Recycle Possibilities</b>	<b>Disposal Options</b>
6. Household Batteries	-contain heavy metals	-record battery types, quantity and date -transfer to 'TOXIC STORAGE AREA' and shelve batteries	-none required	-none	-dispose for secure landfill at TSD facility
7. Lead/Acid Batteries	-corrosive -contain lead	-record battery types, quantity and date -transfer to 'CORROSIVE STORAGE AREA' and shelve batteries or may be stored outside depending on location of facility	-none required	-can be sent to battery recycler (lead smelter) intact	-can dispose at licensed TSD facility if recycler not available
8. Aerosols - cleaners - deodorants - bug spray - etc.	-contents under pressure -may be flammable -may contain CFCs	-record product ID, quantity and date -transfer to 'TOXIC STORAGE AREA' and shelve aerosol cans -aerosols are best stored according to their most hazardous characteristic	-none required	-none	-dispose at licensed TSD facility
9. Propane Cylinders	-contents under pressure and flammable	-record product ID, quantity and date -transfer to outside storage area designated for propane cylinders -place cylinder in wooden rack to prevent it from knocking over onto floor	-none required	-propane cylinders can be sent to supplier in some cases to be shredded and the	-can dispose at licensed TSD facility if recycler not available
10. Miscellaneous Chemicals - adhesives - fuel additives - misc. for auto maintenance - pool chemicals - etc.	-flammable, toxic, corrosive, or reactive	-record product ID, quantity and date -determine from product label information hazardous characteristic ie. is it flammable, corrosive, reactive, etc. -if substance ID is unknown or suspect conduct chemical analyses as required -transfer material to appropriate 'STORAGE AREA' ie. pool chemicals to 'OXIDIZER AREA' and adhesives to 'FLAMMABLE STORAGE AREA'	-conduct ID or verification checks as follows: -pH -flash point -miscibility -reactivity	-unknown	-dispose with lab packs at licensed TSD facility

#### 5.4.1            **Acids/Bases**

Acids and bases will be stored in their designated storage areas. It is important to keep acids separated from bases and to ensure they are not mixed with halogenated or flammable solvents or the metals aluminum (Al), tin (Sn), zinc (Zn) and magnesium (Mg). Gloves and eye protection should be worn at all times when handling corrosive material. All containers should be inspected for leaks and corrosion and be properly labelled and logged.

#### 5.4.2            **Solvents**

Solvents are, in general, flammable and thus must be kept away from all ignition sources including sparks, open flames and excessive heat.

In order for recycling solvents to be effective, a sufficient volume of reasonably clean solvent must be accumulated and the number of different solvent types accumulated in one receptacle should be limited, according to the requirements of a solvent recycler (see Appendix B). Chlorinated solvents should always be collected in a separate receptacle from non-chlorinated solvents. Those solvents suitable for recycling can be kept in a designated recycling area within the confines of the "Flammable Storage Area".

#### 5.4.3            **Paints**

Paints are usually the highest volume waste to be collected at the HHW facility. Household paints are usually either solvent-based (also known as alkyd or oil-based) and combustible or are water-based latex paints, which are water soluble and non-hazardous. Oil-based paint should be kept in the designated "Flammable Storage Area" while latex paint can be collected and

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stored in the "Non-hazardous Storage Area". Procedures for reuse and recycling of paints are detailed in Section 5.5.3.1.

Certain oil-based specialty paints manufactured prior to 1972 contained significant concentrations of PCBs. Generally, these paints were specially formulated to resist breakdown in harsh commercial/industrial environments. Householders could unknowingly be storing some of this PCB-contaminated paint and be planning to dispose of it via a municipal HHW collection.

It is recommended that latex and oil-based or alkyd paints be segregated during bulking operations associated with HHW collections and, to minimize potential problems in the bulked paint, particularly if it is intended for reuse/recycling, the following precautions are suggested:

1. Bulk only clearly identified alkyd or latex paints.
2. Never bulk industrial paints or coatings or specialty paints together with alkyd or latex paints.
3. Never bulk any obviously old paint, ie, more than 15 years old, until it has been tested and found to be acceptable. The charge for PCB testing by a waste management contractor typically ranges from approximately \$35 to \$60 per bulked drum.
4. Never bulk paint where the container contents appear suspect (e.g. oily or clotted in appearance) or do not match the paint description on the label.

The Ministry of the Environment feels that these occurrences are of sufficient importance that attention should be drawn to it. However, it should also be borne in mind that it is over fifteen

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years since these specialty PCB-containing paints were manufactured and it is not anticipated that every batch of bulked oil-based paint will inevitably test positive for PCBs.

#### 5.4.4           **Oil**

Used motor oil received at the facility may be bulked and stored outside, under the direction of gasoline handling and containment codes and procedures. There are several commercial facilities now available that will collect oil from an on-site oil tank for recycling. Prior to sending oil for recycling, it must be tested to ensure that it is not contaminated with PCBs or other hazardous substances.

#### 5.4.5           **Herbicides/Pesticides**

Herbicides and pesticides are extremely toxic and should only be handled when wearing PPE (refer to Section 4.3.1). These chemicals must be lab packed and stored in the "Toxics Storage Area" until they can be disposed of at a licensed facility.

#### 5.4.6           **Agricultural Waste - Pesticides**

Presently, farmers have relatively few options available to them for proper off-site disposal of unwanted or unscheduled pesticides. The household hazardous waste facility offers a convenient and reliable waste management alternative for those farmers wanting to dispose of their pesticide waste in an environmentally sound manner. The following legislative requirements must be taken into consideration when designing a program to incorporate these wastes:

- consideration of the requirements of the Pesticides Act and Regulation 309.
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- farmers are not required to register their waste with the Ministry of the Environment.
- farmers will be in violation of the Pesticides Act if they attempt to transport any unscheduled pesticide from the farm to the household hazardous waste facility.
- storage of agricultural pesticide containers at the household hazardous waste facility must be in compliance with the Pesticides Act.
- establish an exchange program for pesticides will be in violation of the Pesticides Act.
- where the collection of agricultural pesticides is envisaged, application for a Certificate of Approval must specify the inclusion of pesticides originating from farms; request for approval may be worded as commercial/restricted pesticides under Schedules 1, 2 and 5 of the Pesticides Act.

#### 5.4.7 Batteries

Lead/acid batteries can be stored inside the "Acid Corrosives Storage Area" of the facility or outside in a separately assigned storage area. Advantages and disadvantages apply to both storage methods. Outside storage saves valuable indoor storage space but increases the risk of a rupture if temperatures fall below the freezing point. Inside storage eliminates the low temperature problem but any leakage of acid from the battery may produce toxic fumes which could become trapped inside the storage area if adequate ventilation is not provided. The

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location of the facility, in Northern or Southern Ontario, may help dictate the most appropriate storage procedure.

#### 5.4.8            **Propane Cylinders**

The primary concern when handling and storing propane cylinders is that they are under pressure and have a low flash point. Since propane is highly combustible, the cylinders must be protected from being knocked over causing the valve to break open. Recommended storage of propane cylinders is outside in a secure area which permits the cylinders to be placed in racks or strapped securely together.

#### 5.4.9            **Aerosols**

Although aerosols are under pressure and may explode if punctured or heated, storage procedures must comply with the most dangerous property of the contents. For instance, aerosols containing pesticides or insecticides should be stored in the "Toxics Storage Area", whereas aerosols containing air fresheners and deodorants may be stored in the "Flammable Storage Area". Proper precautions must be taken to ensure the most suitable storage of the aerosols according to the hazardous properties of the contents.

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## 5.5 **Waste Reduction, Reuse and Recycle**

The application of waste reduction, reuse and recycle (3R's) should always be considered an effective method of reducing the amount of waste ultimately being disposed in landfills or hazardous waste disposal sites.

### 5.5.1 **Reduction**

Waste reduction can be effectively accomplished if the general public is educated in this regard and receives assistance from organizations such as the collection facility in developing viable methods of waste reduction. Methods of achieving this goal include:

- distribution of literature at the collection facility suggesting methods of reducing household waste;
- advertisements in local papers; and
- advice from facility staff on an individual basis.

Some waste haulers and disposal companies publish fact sheets on hazardous waste reduction techniques for the household. Smaller municipalities may financially benefit from the distribution of these and other information sheets printed by the private sector or government agencies. Section 6 - Public Education and Publicity Guidelines provides further promotional and advertising ideas.

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### 5.5.2      **Reuse**

Reuse of materials deposited at the facility will depend on the type of material and the available market. Factors to be considered in determining a product's suitability for reuse should include:

- hazards associated with the waste material;
- age of the material;
- degree of contamination;
- reuse application; and
- available market.

The facility operator can establish an on-site waste exchange which offers direct distribution to the public of bulked and tested waste materials. This approach has proven successful for paints and may be extended to other materials including woodstains and adhesives. Operators wishing to pursue this activity should keep in mind the following points:

- recyclable wastes can be bulked and tested. If acceptable, the bulked material can be distributed for reuse;
  - further processing, including filtering, must be acknowledged in the Certificate of Approval; and
  - wastes designated for recycling purposes must be kept separate from those wastes requiring disposal.
  - potential liability problems.
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Unless adequate laboratory test procedures can be applied to materials with reuse potential, the possibility exists to recirculate materials containing undetected contaminants. To minimize this risk, some municipalities have begun to bulk materials in 20 litre containers according to specific properties of the material. Costs are greatly reduced on the laboratory analysis performed on representative samples from the bulked mixtures. The procedure for obtaining a representative sample is outlined in the Ministry of the Environment's "Industrial Waste Sampling Procedures Manual", which can be obtained from local Ministry of the Environment district or regional offices. Program operators have also begun to employ portable PCB test kits appropriate for the material being tested and capable of detecting PCB levels below 50 ppm permitting flexibility and cost savings in PCB testing. Another approach is to redistribute only those containers that have not been opened and used.

#### **5.5.3 Recycle**

Options for recycling will again depend on the type of material and the availability of recycling resources. Hazardous wastes arriving at the permanent facility may have high reuse/recycling opportunities. One of the obvious benefits from this activity is the savings in the cost of treatment and disposal. Factors to be considered in determining the suitability of a material for recycling are essentially the same for determining reuse.

In the future, off-site recycling companies will become a more prevalent feature of the household hazardous waste program. Recycling opportunities exist for a variety of materials such as paints, solvents, batteries and waste oil. Appendix B provides a list of hazardous materials recycling companies situated in Ontario. This list is provided for guidance purposes only and does not indicate any preference by the Ministry of the Environment or other government agency

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with respect to any services provided by these companies. Further, other companies may also exist.

Provisions required to expedite the off-site recycling process may vary among recycling companies and material type. In some cases, bulking of the recyclable material will prove more cost and handling effective while in other cases, individual container storage (without lab packing) will be sufficient for storage and shipment. Appropriate storage and handling procedures can be clarified with the recycling company.

Under Regulation 347, generators sending waste materials directly to the end user for recycling purposes, as defined in the Regulation, are not required to complete waste manifest forms.

#### 5.5.3.1                      **Paints**

Used paint products typically represent the largest portion of hazardous wastes received at a household hazardous waste facility. Among those paints received, water-based latex paint accounts for over half of the total paint material with oil-based alkyd paint comprising the remaining paint.

Until recently, recycling of paint was not done on a commercial basis. Two problems have arisen through paint recycling research: contamination of the paint with unknown hazardous substances such as PCBs (see Section 5.4.3), and paints mixed together have unpredictable and inconsistent properties. However, program operators and the Canadian paint industry have begun to seriously address the recycling potential of paint in order to reduce the handling and disposal costs and promote more environmentally sustainable activities. The large volumes of

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paint deposited during the collection program coupled with established paint reprocessing technology make paint a candidate for a recycling program.

Various stakeholders have begun to investigate and assess the viability of an extensive recycling program for Ontario. The Canadian Paint and Coatings Association in conjunction with Laidlaw Environmental Services Ltd. implemented a pilot paint recycling program in 1990. Preliminary demonstration projects have proven the effectiveness of a paint recycling program with 80% of the collected alkyd and latex paints capable of being reprocessed.

Based on the pilot paint recycling program, the Canadian Paint and Coatings Association are optimistic that widespread recycling of latex and alkyd paints can be undertaken in Ontario. The Association is developing markets for recycled paint, worker health and safety instructions in accordance with WHMIS requirements and consumer information on the purchase, use and management of unneeded paint. The Canadian Tinplate Recycling Council is developing the recycling of metal paint cans.

Until off-site paint recycling becomes a viable option, many municipalities have initiated their own paint exchange program. Paints must be tested to eliminate the possibility of contamination. To reduce the costs incurred from individual laboratory testing of the paint containers, some municipalities combine paints into 20 litre containers and then proceed with appropriate testing. In order to reduce the mixing of incompatible paints, paint bulking must take three factors into consideration:

- type (latex, alkyd, nonreusable);
  - colour (brights, darks); and
  - use (exterior, interior).
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#### 5.5.3.2                      **Solvents**

Solvent recycling has become an integral component of waste management in the commercial and industrial sectors. Solvent recycling companies may service household hazardous waste programs and should be pursued by the program operator to determine specific conditions for collecting and handling of the solvents.

In order for solvent recycling to be effective, a sufficient volume of reasonably clean solvent must be accumulated and the number of different solvent types accumulated in one receptacle should be limited. Chlorinated solvents should always be collected in a separate receptacle from non-chlorinated solvents.

#### 5.5.3.3                      **Used Motor Oil**

In Ontario, 'do-it-yourselfer' (DIY) oil changers represent an estimated 25% of the market for motor oil. Over the past decade, numerous used motor oil recycling programs have been initiated and managed by the government, non-profit and private sectors. These endeavours, however, fell short of expectations as a result of an underdeveloped infrastructure which was unable to support effective collection and handling of the DIY's used motor oil. On September 21, 1992 this situation was remedied with the launching by the Ministry of the Environment of a joint industry/government used oil collection program targeting the DIY oil changer (see Appendix A: oil).

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Household hazardous waste collection programs are usually serviced by private waste oil reclaim companies. These programs yield high volumes of used motor oil and program operators generally have no problem arranging a contract with a reclaim company to accept the program's bulked waste oil.

#### **5.5.3.4                      Batteries**

Lead acid battery recycling programs have traditionally been approached in an ad hoc fashion with individual companies initiating separate collection and recovery activities. Recently, some companies have begun to expand recycling activity to include the recycling of plastic battery casings in addition to other battery components that have traditionally been recycled. The battery manufacturing industry is currently studying the recycling of household batteries.

#### **5.5.3.5                      Miscellaneous**

Activity has been facilitated by some innovative recycling companies to expand their recycling services to include less conspicuous materials, such as antifreeze and transmission fluid. Distance to reclaimers and markets and recoverable volumes may factor into the willingness of a company to accept these materials. However, as recycling programs evolve and the supporting infrastructure is developed, greater opportunity will be available for municipalities operating household hazardous waste programs to enter into contract agreements with recycling companies for these and other materials.

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## 6.0 PUBLIC EDUCATION AND PUBLICITY GUIDELINES

Public education and publicity are essential elements to improved household hazardous waste management. In order to maximize the effectiveness of public education and publicity, however, it is necessary to distinguish between them. Household hazardous waste public education focuses on informing the public of the issues associated with household hazardous substances and measures that can be taken to mitigate their negative impacts. Specific household hazardous waste management measures, such as collection initiatives, all benefit from a public education program because the public education program will sensitize residents to the need for sounder household hazardous waste management practices.

Publicity initiatives, on the other hand, have as their objective the dissemination of information concerning specific household hazardous waste management events, such as a designated collection day. Publicity initiatives therefore focus on informing people of specific household hazardous waste management events, and how they may participate in the events.

### 6.1 Advisory Committee

Regardless of any other initiatives taken, the success of a household hazardous waste management program is dependent on the extent to which it is understood and accepted in the community. A first step in the implementation of the program should therefore be to create an advisory committee representative of all sectors of the community. The committee should specifically represent local politicians, municipal staff, local business, local environmental groups, ratepayers associations and local waste haulers; it may also be appropriate for other interests to be represented. The committee should be given the overall responsibility of advising on the design and implementation of the household hazardous waste program, and should accept

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responsibility for disseminating information about the program to the constituencies they represent.

## 6.2 **Public Education**

Effective household hazardous waste public education programs must have several elements to be successful:

- residents must clearly see the relationship between their behaviour and environmental problems associated with household hazardous waste;
- residents must clearly understand the relationship between their changed behaviour and improved environmental protection resulting from new household hazardous management practices;
- residents must have a clear understanding of how they can participate in new household hazardous waste management practices; and
- residents must take personal responsibility for the success or failure of improved household hazardous waste management programs.

Public education of household hazardous waste management issues can be accomplished through a wide variety of passive and pro-active public education initiatives. Passive household hazardous waste public education initiatives make information available to people who want to learn about household hazardous waste, but do not pro-actively seek to inform the public on the subject, for example, a household hazardous waste library may be available to the public as a

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resource centre. Pro-active public education initiatives actively educate the public about household hazardous waste management initiatives; for example, conducting a house tour and showing residents where these waste are generated. While pro-active public education initiatives are likely to result in more rapid change than passive initiatives, they are typically more expensive than passive initiatives and, in order to control costs, may be more narrowly focused in terms of their target audience than passive initiatives. Consequently, a household hazardous waste public education program may be most effectively undertaken with a mix of passive and pro-active initiatives.

Several initiatives are outlined below that have been shown to be effective in public education of the household hazardous waste issues. Other initiatives can also be taken that may be appropriate to local circumstances and the priorities of a local household hazardous waste public education program.

#### **6.2.1 Information Service**

In order to gain access to the most current household hazardous waste information, a service could be made available to the public for continued knowledge and education. Such service could be generally used for dissemination of printed materials, answering inquiries, referring the public to other sources and similar functions. The establishment of an information data bank on household hazardous waste is an important first step in establishing an information service. Information can be made available to the public on an "as requested" basis.

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### 6.2.2      **Group Presentations**

The development of a slideshow and/or video program on household hazardous wastes for presentation to civic groups, community organizations, service clubs, senior groups and school classes is an excellent resource. A staff person can be assigned responsibility for presenting the slideshow/video and for ensuring it remains up-to-date.

### 6.2.3      **Public Events**

Household hazardous waste education information can be provided at large public events and in public places including fairs, shopping malls, and collection events. Displays can focus on factual information and diagrams, with the intention to:

- a)      educate the public about common products that can become household hazardous wastes;
  - b)      act as small workshops to educate the consumer about self treatment methods;
  - c)      make the public aware of alternative non-hazardous products together with source reduction, reuse and recycling initiatives.
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#### 6.2.4 **Open House Events**

As part of a local outreach program or as a special environmental event, a citizen tour can be scheduled in a typical home in order to demonstrate where household hazardous waste is generally found and how it can be appropriately managed. This initiative offers opportunities for demonstration of alternative products with reduced environmental impact, and for discussion of source reduction, reuse and recycling initiatives.

#### 6.2.5 **Worker Training**

Public education can also include specialized training for groups directly affected by household hazardous wastes including refuse collectors, landfill equipment operators and other waste management staff. In part, education of these individuals can focus on safety issues to ensure staff do not injure themselves as a result of handling household hazardous waste.

In addition, refuse collectors can use stickers or tags to inform residents who dispose of hazardous wastes with regular garbage of preferred management approaches.

Demonstrations in community centres could also focus on the dangers to refuse collectors when refuse trucks compact containers of hazardous wastes. Interviews with injured workers could be included.

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#### **6.2.6 Local Business Involvement**

Distribution points can be established for brochures that educate individuals on household hazardous waste management issues through retail outlets which sell products that may become household hazardous waste when discarded. Retailers and service stations can collect household hazardous waste for recycling. Waste oil and auto batteries are examples of products that retailers and/or service stations could collect and recycle, provided that appropriate recycling facilities are available. Manufacturers/distributors can provide point-of-purchase information on the appropriate methods for managing products that may become household hazardous waste when discarded.

#### **6.2.7 Institutional Household Hazardous Waste Reduction Programs**

The reduction in use of potentially hazardous materials in a public facility, school, government office or other public location can be a useful, educational example of hazardous material source reduction. For example, the reduced application of pesticides and herbicides in parks in Toronto have helped demonstrate the need for homeowners to re-evaluate and reduce the use of these toxic substances on their own lawns.

#### **6.2.8 School Curriculum Materials**

The inclusion of household hazardous waste issues within curriculum activities is an excellent method of educating future generations of the environmental implications of improper HHW management.

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School Boards can be approached regarding the inclusion of lessons and other activities relating to household hazardous waste management. It is likely that School Boards will need to review and approve any specific information regarding hazardous waste management before incorporating it into curriculum activities. In addition, the curriculum objectives of any household hazardous waste management information package must be designed to suit the educational level of the targeted school children. Consequently, substantial consultation with a School Board is likely to be necessary in order to appropriately incorporate household hazardous waste management issues within curriculum activities.

A number of class activities can be initiated:

- It may be possible to arrange class presentations with local household hazardous waste program coordinators on a "by invitation" basis. In this case, it may be sufficient to notify the School Board or individual teachers about the availability of speakers and slideshow and/or video presentations.
  - Presentations can be linked to specific courses (such as photography, autoshop, art, horticulture and science classes) that may involve the generation of hazardous materials. The presentations may be followed with assignments that address reduction/reuse/recycling initiatives and a classroom tailored waste management program design.
  - Some innovative educational programs target school children by encouraging them to take an active role in properly identifying and disposing of toxic substances found in their home. Classroom instruction prepares the child to identify hazardous household products and determine the most environmentally safe alternative products. As a homework
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exercise, children may be required to list the hazardous products in their home and, through consultation with their parents, prepare the waste products for disposal at a household hazardous waste collection facility.

- In one municipality in the Region of Durham, school children were asked to complete a household hazardous waste home inventory. Their parents then decided which items were ready for discard through a local household hazardous waste collection initiative that required residents to make a telephone request to have their materials picked up at the home. Presentations on local household hazardous waste initiatives were also made in schools. In total, 2.8 tonnes of material were then collected from the residents in the municipality (population 4,700) over a two month period.

#### **6.2.9 Environmental Choice Program**

The Federal Environmental Choice program can also be used to encourage reduced reliance of products containing materials that are potentially damaging to the environment. The Environmental Choice program sets guidelines for products that are environmentally preferred; many of these products contain reduced quantities of materials that may be environmentally damaging. Products meeting the guidelines of the Environmental Choice program may be labelled with the EcoLogo; the public can be encouraged to purchase these products.

#### **6.2.10 Telephone "Hot Line"**

A telephone "hot-line" is an excellent way to maintain on-going communication with the public regarding household hazardous waste management initiatives. The public can be encouraged to phone the "hot-line" for information on any aspects of household hazardous waste management.

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An answering machine can be employed for after hours calls. The "hot line", therefore, permits public education of household hazardous waste issues in response to specific enquiries.

### 6.3 **Publicity**

A wide variety of initiatives can be undertaken to publicize household hazardous waste collection initiatives. As previously indicated, publicity initiatives should focus on communicating to the public the details associated with a particular household hazardous waste collection or other event. The publicizing of specific events, however, through the media identified does not preclude the insertion of public education messages into publicity materials. In fact, a public education message reminding residents of why the collection program is being undertaken is necessary for publicity associated with a particular household hazardous waste initiative to be most effective.

The publicizing of a household hazardous waste collection program should focus on communicating where the collection will take place, the time the collection will take place, how residents may participate in the collection, and any requirements of residents in the preparation of their waste materials. In order to attract the attention of the public, publicity events should be visually attractive and should communicate essential information a concise manner.

#### 6.3.1 **Newspaper and Magazines**

Available research indicates that newspaper advertising is often the medium through which most participants in a household hazardous waste collection initiative learn of the initiative. A budget should be developed to cover the estimated cost of newspaper or magazine advertising . An estimate should be made about how many advertisements a municipality can afford to purchase,

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including the size, the design and the number of days to run them on. Public service announcements that the newspaper or magazine will run can contain promotional flyers as fillers. Household hazardous waste collection initiatives may be considered newsworthy items by local newspapers and magazines, and may present opportunities for feature articles that publicize collection events. Press releases should be distributed to all local media to raise interest in the collection programs.

#### 6.3.2 Posters, Flyers and Brochures

Household hazardous waste collection initiatives may be effectively publicized through the use of posters, flyers and brochures. These are typically low cost items to produce and can be both widely distributed and targeted to specific household hazardous waste management generating activities.

Posters: Posters are effective in communicating household hazardous waste collection initiatives in public places. In particular, poster formats allow the use of graphic design to convey information pictorially.

Flyers: Flyers can be distributed on a mass basis to individuals to inform them of a collection program. Utility bill inserts have been extremely effective in communicating household hazardous waste management initiatives where they have been used.

Brochures: The format of brochures generally allows a greater amount of information to be communicated than is permitted by the format of posters and flyers. Public education information can be communicated in a brochure format together with publicity concerning specific household hazardous waste initiatives.

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A wide variety of other initiatives can also be undertaken to publicize a household hazardous waste event. T-shirts, bumper stickers, refrigerator magnets, pins and balloons have all been used to effectively publicize collection events. Public service announcements can be made on local T.V. and radio stations. Banners can be made and door hangers can be distributed.

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## **APPENDIX A**

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## APPENDIX A

Table A-1 identifies the range of household hazardous waste programs that have been undertaken in the United States, Canada and Europe. Table A-2 outlines systems that have been adopted in Ontario. As reference tools these case studies outline different options for collecting household hazardous waste.

### Collection Days

Perhaps the most common method used to collect household hazardous wastes is the "collection days" option. On a particular collection day, residents are asked to bring their hazardous wastes to a temporary transfer station or depot. While events are normally restricted to household hazardous wastes, some programs have chosen to include small quantity industrial hazardous waste generators; for example, Anchorage, Alaska.

Collection days have traditionally been offered once annually or several days throughout the year, often occurring during a weekend. In addition, they may be held at one or more sites in the community in order to conveniently service the largest portion of a community's population. Locations for collection days have included shopping centres, parking lots, high school parking lots, government office yards, fire stations, solid waste transfer stations, landfill sites and other locations. Staffing may include waste disposal contractors, regional, municipal or city staff members and senior level government staff.

More recently, communities have opted for a modified version of the traditional collection day event in which a depot collection site provides the infrastructure necessary for storage of household hazardous wastes collected on an infrequent schedule. Collection days may still be

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TABLE A-1  
US, CANADIAN & EUROPEAN SYSTEMS

<b>SYSTEM</b>	<b>LOCATION</b>	<b>DESCRIPTION</b>	<b>SIZE OF POPULATION</b>	<b>RESPONSIBILITY</b>	<b>REUSE OR RECYCLE</b>	<b>COST PER YEAR</b>
Permanent Sites	8 sites in British Columbia	Established locations for ongoing waste drop-off usually located at existing public locations	2,000,000	BC MOE	nil	\$80,000
Collection Days	Palo Alto, California	Selected events held one to four times a year where citizens can drop off their waste on certain days at one or more locations.	56,000	City of Palo Alto	oil antifreeze	\$110,000/yr.; each event \$25,000 to \$30,000
Combination Permanent Site & Collection Days	San Bernardino, California	Combination of the above two systems.	1,000,000	County of San Bernardino	batteries oil mercury	\$215,000
Curbside pickup	Bad Kreuznach, Germany	Trained personnel pick up waste from residents' home similar to a typical curbside pickup.	unknown	Municipality of Bad Kreuznach	nil	300,000 / year (1989 Deutschmarks)
Phone In Service (Door to door)	San Diego, California	Trained personnel pick up waste from residents' home by appointment	1,070,310	County of San Diego	paints solvents	\$600,000 - 800,000
Selective Collection	Annapolis, Maryland	Certain wastes, usually large volumes or highly toxic waste are targeted for collection.	33,940	County of Maryland	oil	charging 25 cents per gallon
Mobile Units	King County, Washington	Collection facilities that move from community to community and set up collection days.	1,300,000	King County	paints oil solvents	27 month contract \$1,500,000
Private Waste Management Co. Service	Seattle/King County Washington, USA	Private waste handling companies open their facilities to the public for the collection of HHW.	1,000,000	Volunteer program by private companies	paints oil solvents	\$261,000
Manufacturer Take Back	Massachusetts	Manufacturers of certain wastes are required to take back the waste generated from the products they sell: -used oil is accepted by service stations.	5,778,300	Retailers are required by law to offer service	oil	\$490,000

**TABLE A-2**  
**ONTARIO HOUSEHOLD HAZARDOUS WASTE SYSTEMS**

<b>SYSTEM &amp; YEAR PROGRAM INITIATED</b>	<b>LOCATION</b>	<b>DESCRIPTION</b>	<b>POP. SERVED</b>	<b>RESPONSIBILITY</b>	<b>MATERIALS REUSED/RECYCLED</b>	<b>COST PER YEAR</b>
Permanent Site 1989	Region of Halton	Established locations for ongoing waste drop-off usually located at existing public facilities.	284,000	Municipality of Halton	oil	\$236,274
Collection Days 1989	Region of Peel	Selected events held one to four times a year where citizens can drop off their wastes on certain days at one or more locations.	31,000	Joint venture between Region of Peel (50%) and City of Mississauga	nil	\$223,843
Combination Permanent Site & Collection Days 1989	North Simcoe	Combination of the above two systems.	42,000	North Simcoe Waste Management Association	nil	\$22,610
Curbside Pick-up	Has not been undertaken in Ontario					
Phone-in Service Door-to-door 1989	Metropolitan Toronto	Trained personnel pick up waste from residents' homes by appointment	2,130,855	Metropolitan Works Department	lead-acid automobile batteries propane cylinders	\$201,044
Selective Collection 1975 (no longer operating)	Kent County	Certain wastes, usually large volumes or highly-toxic waste, are targeted for collection.	105,176	Kent County	nil	\$70,000
Mobile Unit	Has not been undertaken					
Private Waste Management Co. Service 1990	City of St. Catharines	Private waste handling companies open their facilities to the public for the collection of HHW.	124,000	Administration: City of St. Catharines Operation: Laldiauw	oil, propane cylinders lead-acid batteries propane and batteries-sent to respective recycling companies	\$150,000
Manufacturer Take Back 1989	Region of Ottawa Carleton	Manufacturer of certain wastes take back the waste generated from the products they sell; i.e. medication accepted by pharmacists	600,000	Ottawa Carleton Health Department Ottawa Carleton Pharmacy Association		

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held once a month or several times a year but instead of paying the high costs associated with hiring a waste hauling company for each individual collection event, wastes can be stored on a temporary basis until adequate accumulation warrants the hiring of a waste haulage and disposal company.

Under normal circumstances collection days are established to capture the full range of household hazardous waste but, in some instances, specific wastes such as pesticides are targeted. Almost all programs have been free to the participating public, but will specify volumes and/or types of wastes accepted. Most Ontario collections have excluded extremely hazardous wastes such as radioactive materials, explosives and PCBs. Other wastes such as pathological wastes may also be excluded from a collection day program because of the specialized management procedures involved.

**Advantages:**

- permits smaller communities to offer collection service to citizens without paying ongoing operation costs;
  - the Certificate of Approval will be easier to obtain;
  - provides a good way to determine the need for a permanent facility without having to pay high capital and operating costs initially; and
  - requires less lead time to implement than a permanent site.
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**Disadvantages:**

- incur high operating costs since wastes cannot be transported until large quantities are obtained;
- not convenient for householders who may be away during the scheduled collection day;
- advertising must be scheduled well in advance to inform citizens of the collection date;
- citizens must have access to a vehicle and plan in advance to attend on that day; and
- does not address the disposal of unwanted household products after the event is over.

**Case Study: Town of Grimsby**

The Town of Grimsby together with three other municipalities (West Lincoln, Lincoln and Pelham) have offered bi-annual collection day events on a rotating basis. Based on this alternating schedule, each municipality initiates a collection day once every two years. In October of 1990, the Town of Grimsby had its turn.

Cost information for 1990:

Population served - 53,000

Total number of collection days - 1

Number of participants - 596

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Operating Costs

•	tent and tarps (rental)	\$ 1,500
•	container replacement	\$ 1,280
Total Operating Costs - \$ 2,780		

Labour Costs

•	hired waste handling company	\$ 4,300
•	municipal staff	\$ 4,400
Total Labour Costs - \$ 8, 700		

Disposal Costs

•	disposal costs	\$51,280
Total Disposal Costs - \$51,280		

**Case Study: North Simcoe**

In 1989, North Simcoe established a permanent household hazardous waste collection site, in addition to operating a program of collection days. This facility consists of a concrete pad encased by an eight foot chain-link fence with a roof covering the premises. Wastes are stored in a designated storage area with lead/acid batteries and propane cylinders separated from each other and all other hazardous wastes. A portable trailer provides shelter for most wastes with the exception of batteries and propane cylinders. The basic design of the collection site may fulfil storage requirements for a infrequently operated program, however, will not provide adequate storage and safety conditions for a more sophisticated program.

Trained full and part time municipal employees have access to the storage facility. The general

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public is not permitted to enter the storage facility. Hired on a part time basis, a qualified chemical technician is responsible for the receiving, logging and preparation for pickup by waste haulers of all household hazardous waste delivered to the facility. This individual is on call in the event that a highly hazardous material is brought to the depot during non-designated operating times. Assistants share in the handling and sorting duties which help to minimize the payments commanded by the haulage companies.

Cost Information for 1989:

Population served - 42,000

Program operation - third Saturday of every month

Total number of collection days - 12

Capital Costs

- depot - concrete pad (30'x 30')
  - portable trailer
  - 2 separate storage areas  
(for batteries and propane cylinders)
  - oil drum\$15,000
- roof covering the concrete pad \$ 7,000
- safety equipment
  - clothing for one person
  - fire extinguishers
  - vermiculite\$ 2,000

Total Capital Costs - \$24,000

Labour Costs

- 1 chemist supervisor (part-time @ \$15/hour) \$ 4,000
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•	1 waste reduction coordinator (@ 10% time)	\$ 3,000
•	2 assistants (part-time @ \$12)	\$ 1,440

Total Labour Costs - \$8,440

Disposal Costs

•	disposal cost	\$41,600
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Total Disposal Cost - \$ 41,600

**Combination Permanent Site and Collection Days**

The combination of permanent site and collection days is a system that has been widely used in the United States. The permanent site/ collection days option serves the public by providing a regular household hazardous waste collection service where residents may bring their household hazardous wastes at any time; in addition a collection day service is held as a complement to the permanent site. The system is flexible in that it allows the resident various location options for disposal and provides service after or between the collection day events. This system not only acts as a means to remind residents about the dangers of household hazardous wastes (with the collection day component) it also prompts media attention to publicize the ongoing collection centres. It is much easier to get press coverage for a timely event than for an ongoing program which has been operating for some time. In addition to publicizing the permanent collection centres, this option serves as a constant reminder to all citizens of the need to carefully dispose of their household hazardous wastes.

**Advantages:**

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- collection days may act as "satellite" collections to a permanent facility and feed materials to a permanent facility for bulking and storage;
- provides the option of increasing the number of collection days as demand increases;
- frequently scheduled collection days permit more convenient scheduling for the public;
- allows for more effective use of promotional and advertising media;
- able to establish a routine collection day system;
- provides a continuing opportunity to collect household hazardous wastes and small quantities of industrial hazardous wastes if the permanent site is open each day; and
- can use full-time public works employees on a part-time basis.

#### **Disadvantages**

- may be expensive depending on the complexity of the permanent facility and the frequency of collection days; and
- not accessible to all citizens who may need a vehicle to deliver their wastes.

#### **Case Study: Peel Region**

The Region of Peel offers two collection systems: a depot collection system and occasional collection days. The household hazardous waste depot, situated at the Britannia landfill site, is open to the public on weekends and two weekdays. For much of Peel's population, however, the depot remains an inaccessible and inconvenient disposal option. To augment the depot, the Region offers individual collection days throughout the area.

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Household hazardous waste days have been held in the communities of Mississauga, Brampton and Caledon. These collection days operate in the traditional fashion whereby a certified waste management firm is scheduled to arrive at a designated location and perform all the handling, sorting, documenting and transportation activities for incoming household hazardous wastes. A permanent depot is also located in Mississauga.

- City of Mississauga - In 1989, the City of Mississauga offered four collection days on consecutive Saturdays in the months of October and November. The waste handling company assumed control of every aspect of the operations; volunteers were not used. To reduce costs, some wastes were bulked, such as paints, stains and varnishes.

Population served - 450,000

Total number of collection days - 4

Number of participants - 1059

Total cost - \$131,836

Average cost - \$32,959

Cost per participant - \$124

- Town of Caledon - Caledon operated its first collection day in the Fall of 1990. Unlike Mississauga, numerous volunteers provided assistance in the receiving and handling duties, leaving the sorting, packing and documentation responsibilities to the waste hauler. All materials were lab-packed.

Population served - 33,000

Total number of collection days - 1

Number of Participants - 337

Total cost - \$42,845

Cost per participant - \$127

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- The permanent depot located at Britannia Landfill offers a more extended collection system, other than the individual collection day approach provided by Mississauga, Caledon and Brampton. Originally offering only week-end service, in 1989 public demand for the household hazardous waste collections resulted in a grant from the Ministry of the Environment to extend the hours of operation at the depot to include Wednesday and Thursday of each week. In addition, the storage receptacle has been expanded to accommodate increases in the volume of household hazardous waste received at the facility.

Population served - 660,000

Total number of collection days - 104

Number of participants - 2847

Total Cost - \$248,000

Cost per participant - \$87

#### **Phone-in Service**

(Door-to-door)

Many larger communities have experimented with door-to-door service, using it to augment the depot collection system. The phone-in service is a method of assistance to a resident, where household hazardous waste materials are collected at the doorstep. Trained personnel come to a residence and materials are then transported to a permitted waste management facility. Unlike the other household hazardous waste collection systems, the door-to-door program offers additional assistance to disadvantaged residents.

#### **Advantages:**

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- provides a service for people unable to access fixed facilities and benefits the elderly, handicapped or people without a car;
  - ensures more control over the receiving and handling of wastes, especially unidentified material;
  - can be used by households with very dangerous substances that should not be moved by a resident; and
  - provides a means of disposal for hazardous materials that have been abandoned.

**Disadvantages:**

- the hours of operation do not suit people who work during the day;
- must arrange a scheduled pick-up and be at home when the vehicle arrives;
- most programs stipulate a minimum quantity required for pick-up;
- unable to service as many households as the depot collection system;
- requires more organization and scheduling to ensure efficient use of the collection vehicle; and
- not as cost effective as other collection systems;

**Case Study: Metropolitan Toronto's 'Toxics Taxi' Service**

Metropolitan Toronto runs a phone-in household hazardous waste collection service known as the "Toxics Taxi", in which household hazardous wastes are picked up on public request. In April, 1989, the Metro Works Department commenced a six month trial program for the pick-up of household hazardous waste. Following the success of the trial, residents unable to transport their household hazardous waste materials to permanent drop-off depots are now given

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opportunity to participate in household hazardous waste collection. While the pick-up service is designed to complement the presently existing depot system, it is perhaps the most extensive of its kind, given the sizable population involved. In conjunction with the Toxics Taxi, a telephone "hot line" service has been established to schedule pick-ups as well as answer all inquiries pertaining to household hazardous waste. Operating out of a retrofitted cube van a truck driver and a chemical technician collects household hazardous wastes from 8:30 a.m. to 4:30 p.m., Monday to Friday, following a prearranged schedule. The crew must have the same type of training as staff operating permanent household hazardous waste depots. Additional training is provided for the crew on the Transportation of Dangerous Goods Act and Regulations as well as the proper method of packaging and documenting household hazardous waste for safe transport.

Household hazardous waste materials must be identified by residents, and not left unattended at curbside. Householders are requested to be at home for the pick-up. At each residence, waste accepted is documented, sorted into compatible groupings and packed in steel drums which are sealed and secured before moving between residences. In the event that the resident does not comply with Metro's requirements, the crew may refuse to accept the household hazardous waste. At the end of each day, all drums containing household hazardous waste are off-loaded in accordance with conditions imposed by the Certificate of Approval governing program. One truck makes approximately 10-12 pick-ups per day. Although the Metropolitan Works Department takes full responsibility for the program and its facilities, treatment and disposal is contracted to Laidlaw.

As part of Metro's contribution to 3Rs efforts, during the operating year of 1989 all propane cylinders and lead/acid automotive batteries collected under the program were subsequently reutilized. These wastes were either refurbished and reused or shipped to a recycler.

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For the future, Metro intends on recycling more household hazardous waste material in order to conserve resources and reduce and overall costs of the program. They will seek out companies that can reuse, recover or recycle materials collected through the program and prepare the wastes to meet their requirements.

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Cost Information for 1989

Population served - 2.1 million

Program operation - January 1989 - December 1989

Number of Participants - 1615

Total amount of waste collected - 40,462 kg

Cost per participant - \$157

Capital Costs

●	cube van (@ \$918/month)	\$11,016
●	storage units for the vehicle	\$ 1,000
●	equipment - drums	\$ 6,000
	- safety equipment	\$ 900
	- clothing	\$ 100
	- packing material	\$ 800

Total Capital Costs - \$19,816

Operating Costs

●	vehicle - insurance	\$ 2,000
	- gas (@ \$60/week)	\$ 3,120
	Miscellaneous -	500

Total Operating Costs - \$5,620

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Labour Costs

●	driver (full-time)	\$ 33,557
●	chemical assistant (grade 1)	\$ 30,379
●	clerk (to set schedule)	\$ 23,908
●	foreman	\$ 9,474
●	administration	\$ 10,700

Total Labour Costs - \$108,518

Disposal Costs

Total Disposal Cost - \$120,198

Selective Collection:

Certain types of wastes are considered "priority" wastes by household hazardous waste managers either because of the large volumes that are collected or the degree of toxicity. Some communities have developed collection programs that focus on specific household hazardous waste materials. These programs range from not accepting motor oil at a collection day in order to encourage residents to utilize existing recycling centres within the community, to holding a collection for paint only in order to separately deal with a large volume waste, to offering a program for the collection of pesticides by appointment. These programs have generally been set up because existing facilities and personnel had the resources and/or expertise to collect and store only certain amounts or types of household hazardous waste.

Pesticides:

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In 1989, a waste pesticides collection program was undertaken in Kent County. Under the auspices of the Waste Management Branch the Kent County program ran on three separate days and included both urban and rural residents. The total cost of the program was \$74,000 with \$50,000 going to the contractor who handled the disposal of hazardous materials. The remaining \$24,000 went to county staffing costs, advertising and other organizational expenses.

The quantity of pesticides received was significantly higher than expected and much of the \$50,000 can be attributed to cost of their disposal. However, the County had an upper limit on the contract so that the potential cost for pesticide disposal may have been as high as \$65,000.

#### **Pharmaceuticals:**

Outdated and waste pharmaceuticals have been collected in the Region of Ottawa-Carleton. Funded by the Ministry of Health, the Canadian Seniors for Citizen Responsibility worked in conjunction with the Regional Health Inspectors, the Regional Health Unit and the Ottawa-Carleton Pharmacies Association to organize a collection program better known as the "Medicine Cabinet Cleanup". Initiated in October 1989 this was a 10 day program involving 140 different pharmacies at 10 central locations and arranged in conjunction with an Ottawa-Carleton household hazardous waste day.

#### **Oil:**

Environment Canada established a used motor oil recovery program in the Golden Horseshoe area of Ontario in 1985. The program was aimed at receiving used motor oil from do-it-yourself (DIY) oil changers. The Federal Government looked for another organization to continue the

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program. The Pollution Probe Foundation accepted the responsibility. In 1987 Pollution Probe started the "Oil Drop" program in Metropolitan Toronto for one year.

A year after the program had commenced it was discontinued for various reasons. Some major problems with the program included:

- toxic contaminants in the oil; and
- often stations charged \$.20-.30/gallon depending upon location, quantity and quality of oil. Many stations as a result showed a decline in volume of oil collection during the program. Others, however, showed increases which were much greater than could be attributed to "Oil Drop".

The program was then taken over by the Recycling Council of Ontario (RCO) and was shortly dropped. The program has since been discontinued.

While the "Oil Drop" program had attempted to address the residential oil disposal problem, its demise was not for its lack of participation. It was recognized, especially by the oil industry, that there was an urgent need to address this issue and that a more successful residential oil collection program would require among other factors:

- a) greater control over the oil being deposited;
  - b) a more sophisticated advertising and promotional program; and
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c) greater availability to communities.

To actively promote the resale of reclaimed motor oil, customers must be assured of consistent, high quality standards for the product. Collection programs offered through the household hazardous waste programs provide a reliable front-end collection system for used oil but have little control over the intermediary reprocessing stage. In response to this dilemma, on September 21, 1992, Ontario's Environment Minister launched a joint industry/government used oil collection program that targets the do-it yourself (DIY) oil changers. This product stewardship initiative was the result of an agreement specifying that all sellers of lubricant oil shall accept used oil from customers. The handling and reprocessing stages will be coordinated and monitored by CPPI in consultation with other public and private sector agencies. CPPI anticipates that when fully implemented the program will achieve about 70% recovery of the DIY motor oil market share.

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## APPENDIX B

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# Market Opportunities for Recyclable Materials Collected at Household Hazardous Waste Facility

Materials	Market/Recycling Opportunities		Comments
Solvents	Alenco Soltec Ltd. (416) 878-2627	425 Morabel Drive Milton, Ontario L9T 4N6	<ul style="list-style-type: none"> <li>- reclaim ink solvents and handles organic solvents</li> <li>- pick-up service for large quantities only, charge involved</li> </ul>
	Anachemia Solvents Ltd. (416) 279-5122	3549 Mavis Road Mississauga, Ontario L5C 1T7	<ul style="list-style-type: none"> <li>- recycle a full range of solvents</li> <li>- pick-up service provided, charge involved</li> <li>- minimum quantity necessary depending on type of solvent</li> </ul>
	Canam Oil Services (Safety-Kleen Canada Ltd) (416) 669-9516	101 Planchet Road, Unit 1 Concord, Ontario L4K 2C6	<ul style="list-style-type: none"> <li>- variety of solvents recycled, primarily paint solvents</li> <li>- pick-up service provided</li> </ul>
	Doromco Ltd. (416) 523-4957	11 Flatt Avenue Hamilton, Ontario L8P 4M9	<ul style="list-style-type: none"> <li>- recycles solvents</li> <li>- pick-up service provided, charged involved</li> </ul>
	Industrial Chemical Refiners Ltd. (416) 421-9225	24 Industrial Street Toronto, Ontario M4G 1Y9	<ul style="list-style-type: none"> <li>- recover chlorinated solvents and freons</li> <li>- no minimum quantity required</li> <li>- pick-up service provided, charged involved</li> </ul>
	Oakside Chemicals Ltd. (519) 681-1103	97 White Oak Road London, Ontario N6E 1L8	<ul style="list-style-type: none"> <li>- reclaim solvent wastes in excess of 75% recoverable</li> <li>- minimum delivery of ten drums required</li> <li>- no pick-up provided, charge involved</li> </ul>
	Recovered Chemicals (416) 281-2047	404a Old Kingston Rd Scarborough, Ontario M1C 1B6	<ul style="list-style-type: none"> <li>- reclaim chlorinated and flammable solvents</li> <li>- pick-up service provided, charge involved</li> </ul>
	Solvtec Corporation (416) 670-0757	5775 Atlantic Drive Unit 16 Mississauga, Ontario L4W 4P3	<ul style="list-style-type: none"> <li>- accept all solvents, no minimum quantity required</li> <li>- pick-up service provided, charge involved</li> </ul>
	Van Waters and Rogers Ltd. (416) 741-9190	64 Arrow Road Weston, Ontario M9M 2L9	<ul style="list-style-type: none"> <li>- recover chlorinated solvents, minimum one drum required</li> <li>- pick-up service provided, charge involved</li> </ul>

# Market Opportunities for Recyclable Materials Collected at Household Hazardous Waste Facility

<i>Materials</i>	<i>Market/Recycling Opportunities</i>	<i>Comments</i>
	<p>Varnicolour Chemicals Ltd. (519) 669-5491</p> <p>Woodington Systems Inc. (416) 680-1900</p>	<ul style="list-style-type: none"> <li>- recycle most solvents</li> <li>- minimum quantity determined by distance</li> <li>- pick-up service provided, charge involved</li> <li>- recover solvents</li> <li>- pick-up service provided, charge involved</li> </ul>
Paints	<p>425 Morabel Drive Milton, Ontario L9T 4N6</p> <p>101 Planchet Road, Unit 1 Concord, Ontario L4K 2C6</p> <p>11 Platt Avenue Hamilton, Ontario L8P 4M9</p> <p>31 Steve Fonyo Drive Unit 106 Kingston, Ontario K7M 6R7</p> <p>5369 Maingate Drive Mississauga, Ontario L4W 1G6</p> <p>5775 Atlantic Drive Unit 16 Mississauga, Ontario L4W 4P3</p> <p>5369 Maingate Drive</p>	<ul style="list-style-type: none"> <li>- reclaim industrial paints, large quantities only</li> <li>- pick-up service provided, charge involved</li> <li>- reclaim paint sludges</li> <li>- pick-up service provided</li> <li>- reclaim paint sludges</li> <li>- pick-up service provided, charge involved</li> <li>- recycle paint</li> <li>- recover paints</li> <li>- pick-up service and charge may be involved</li> <li>- reclamation of sludges and paint waste</li> <li>- pick-up service provided, charge involved</li> <li>- recycle bulk loads of paints</li> </ul>



# Market Opportunities for Recyclable Materials Collected at Household Hazardous Waste Facility

<b>Materials</b>	<b>Market/Recycling Opportunities</b>		<b>Comments</b>
Photographic Chemicals	Maranatha R/S Ltd. (416) 857-2738	P.O. Box 391 Bolton, Ontario L7E 5T3	<ul style="list-style-type: none"> <li>- reclaim silver from fix</li> <li>- minimum charge of \$50</li> <li>- pick-up minimum 25 gallons</li> </ul>
	Varnicolour Chemicals Ltd. (519) 669-5491	P.O. Box 174 62 Union Street Elmira, Ontario N3B 2Z6	<ul style="list-style-type: none"> <li>- recycle photographic chemicals</li> <li>- minimum quantity determined by distance</li> <li>- pick-up service provided, charge involved</li> </ul>
Liquid Wastes	A and A Liquid Waste Removal Co. (416) 746-1156	16 Taber Road Rexdale, Ontario M9W 3A5	<ul style="list-style-type: none"> <li>- most liquid wastes accepted</li> <li>- no minimum quantity required</li> <li>- pick-up service provided, charge involved</li> </ul>
	Accurate Waste Disposal (416) 223-0436	1929 Highway #7 West Concord, Ontario L4K 1V5	<ul style="list-style-type: none"> <li>- most liquid wastes accepted</li> <li>- pick-up service provided, charge involved</li> </ul>
	Laidlaw Environmental Services Ltd. (416) 227-7872	P.O. Box 188 1831 Allanport Road Thorold, Ontario L2V 3Y9	<ul style="list-style-type: none"> <li>- most liquid wastes accepted</li> <li>- minimum pick-up of 450 litres (100 gallons)</li> <li>- charge involved</li> </ul>
	C.H. Helst Ltd. (416) 842-6920	700 Dorval Dr., Suite #508 Oakville, Ontario L6K 3V3	<ul style="list-style-type: none"> <li>- most liquid wastes accepted</li> <li>- pick-up service to large truckload quantities</li> <li>- charge depends on distance</li> </ul>
	Chem-Serve Associates Inc. (416) 688-5161	P.O. Box 1254 St. Catharines, Ontario L2R 7A7	<ul style="list-style-type: none"> <li>- most liquid wastes accepted</li> <li>- pick-up service with no minimum quantity</li> <li>- charge determined by type of waste</li> </ul>
	Chem Tech Environnement Inc. (514) 875-6017 (514) 645-7050	4192 Grande-Allee Greenfield Park, Quebec J4V 3N2	<ul style="list-style-type: none"> <li>- most registerable liquid and solid wastes accepted</li> <li>- recycling options for solvent and paint wastes</li> <li>- pick-up service provided; no minimum quantity</li> <li>- charge dependent upon characteristics of waste</li> </ul>
	Doromco Ltd. (416) 523-4957	11 Flat Avenue Hamilton, Ontario L8P 4M9	<ul style="list-style-type: none"> <li>- most liquid wastes accepted</li> <li>- pick-up service provided, charge involved</li> </ul>

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Materials	Market/Recycling Opportunities		Comments
Palro Environmental Management Systems Ltd. (519) 756-9200	P.O. Box 1477 Bradford, Ontario N3T 5V6		<ul style="list-style-type: none"> <li>- most liquid wastes accepted</li> <li>- pick-up service with no minimum quantity</li> <li>- 4 hour minimum charge</li> </ul>
Re-Chem Environmental Management Inc. (416) 847-6809	4390 Paletta Court, Unit K Burlington, Ontario L7L 5R2		<ul style="list-style-type: none"> <li>- handle all registerable liquid and solid wastes</li> </ul>
Retek Resource Recovery Inc. (416) 333-0440	66 Mohawk Road P.O. Box 1584, Unit 18 Brantford, Ontario N3T 5V6		<ul style="list-style-type: none"> <li>- handle all registerable liquid and solid wastes</li> <li>- pick-up minimum of 5-6 drums, charge involved</li> </ul>
Safety-Kleen Canada Inc. (416) 461-6354	P.O. Box 130 Breslau, Ontario N0B 1M0		<ul style="list-style-type: none"> <li>- recycle used motor oil</li> </ul>
Thomscan Industrial Services Inc. (416) 624-1264	5369 Maingate Drive Mississauga, Ontario L4W 1G6		<ul style="list-style-type: none"> <li>- recycle bulk loads of liquid wastes</li> <li>- pick-up service provided, charge involved</li> </ul>

Note: This table is provided for information purposes only and is subject to change. It does not necessarily include all companies that may be able to recycle household hazardous wastes. The inclusion of a company in this table does not constitute endorsement of the company by any government agency and, conversely, omission of any company from this table does not constitute any government agency disavowal of a company.

## **APPENDIX C**

**MINISTRY OF THE ENVIRONMENT REGIONAL AND DISTRICT OFFICES**

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## APPENDIX D

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STAFF PARKING

CONCRETE CURB

ROOF CANOPY ABOVE



MINISTRY OF THE ENVIRONMENT

ARCHITECTURAL

DATE

90 12 20

SCALE

1:100

HOUSEHOLD WASTE COLLECTION STATION  
PLAN

DRAWING No.

1 of 1





